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COVER ILLUSTRATION

Robert Dudley (fl. 1865–1891)

HMS Monarch *Transporting the Body of George Peabody*, 1870
43" x 72"

Massachusetts native George Peabody (1795–1869) spent much of his time as a successful investor and merchant living in London. He was so renowned for his dedication to philanthropic causes in education, the arts, and housing for the poor that upon his death in the winter of 1869, Queen Victoria engaged the most modern battleship in the Royal Navy to return his body to his home for burial.

This enormous painting depicts HMS *Monarch*, the first successful British armored turret ship, clearing Portsmouth Harbor with an American ensign flying atop the main. Capable of traveling at fifteen knots under full steam, *Monarch* made the transatlantic voyage in company with the United States corvette *Plymouth* for a leg of one of the longest funeral processions in history. The painting is a recent museum acquisition in recognition of the bicentennial of George Peabody's birth.

Oil on Canvas
Peabody Essex Museum Collection
Purchased with funds donated anonymously

Peabody Essex Museum Photograph by Mark Sexton

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To the *Neptune* Readers

We are delighted to announce that the new Editor-in-Chief of *The American Neptune* is Professor Barry M. Gough who comes to us from the Department of History, Wilfrid Laurier University in Waterloo, Ontario, Canada. A long-time member of *The American Neptune* Editorial Advisory Board, Barry and his immensely productive work are familiar to most maritime historians. His previous editorial experience will serve us well, enabling that wider audience who enjoy the accounts of ships, the seas, and those who have sailed them — for mercantile gain, defending their nation's interests, or the love of voyaging and exploration — to read *The Neptune* with pleasure and profit. Barry, we welcome you to this distinguished — but arduous — position.

Peter Fetchko
Director of Curatorial Operations
Peabody Essex Museum

Editor-in-Chief's Note

The American Neptune enjoys a fifty-five year history of producing the best available commentary on American and international maritime history. With this issue, which falls under my editorship, we continue the tradition of articles of importance in maritime history.

Our lead article is on the voyage of the *Experiment* to China. Yankee trade to China in the years after the American Revolution was the great new business activity of American seaborne commerce. This welcome addition to learned study tells about the problems of investors seeking to answer needs of a market half a world away. This article joins an already rich literature on American trade to China, and this journal seeks other contributions to this important body of knowledge, where the cultural and artistic aspects of connections with China are of universal attraction.

Our knowledge of North American native capabilities on rivers and lakes has been all too sparse, mainly for want of documentation. Readers will find our articles on the Ojibwa's naval history to be informative as well as thought-provoking. Joining this article to complete the issue are pieces on the loss of the Hudson's Bay Company's vessel *Isabella* at the Columbia River and on the history of an important "propeller," the *Indiana*. It may be observed that two of our authors are resident in Canada, a country whose maritime history profession is buoyant in this age. In future issues, we will welcome additional Canadian material.

Our book reviews are again full of interest and diversity. They span a number of fields, including Indian Ocean developments, gunnery, ship design, commercial fishing vessels and owners and, in keeping with our current emphasis in naval history, radar, and war at sea 1939–1945. There is rich diversity here and good food for thought. We aim to review the best books in maritime history and always welcome suggestions from our readers.

Barry Gough
Editor-in-Chief

AN "EXPERIMENTAL" VOYAGE TO CHINA 1785–1787

PAUL E. FONTENOY

A venture from the United States to China in the late eighteenth-century was a risky undertaking. The absence of a strong market for U.S. goods handicapped American trade. A voyage to Canton also represented a major capital investment. Merchants, therefore, financed this commerce through multiple small-scale investors to limit individual exposure to risk and promoted each departure as a self-contained venture. The voyage of the sloop *Experiment* to Canton strikingly demonstrates these salient characteristics of early American commerce with China.

The *Empress of China*, the first American ship in the China trade, returned in triumph to New York on 11 May 1785. Its investors enjoyed a clear profit of between twenty-five and thirty percent and refitted the ship for a return voyage to Canton, financed by a new partnership.[1]

The success of the *Empress of China* stimulated a group of New York and Albany businessmen to consider their own venture to Canton, employing an 85-ton sloop appropriately named the *Experiment.* Theirs was a much less ambitious undertaking, but then it was not backed by Robert Morris, the Philadelphia "Financier of the Revolution," who had been the principal supporter of the *Empress of China*'s venture. Nevertheless, this was a significant enterprise: it was only the second direct voyage from the new United States to China, and the *Experiment* was a very small vessel indeed, particularly in comparison with East Indiamen of 1,000 tons or more that European companies employed in the Canton trade. The venture's commercial aspects illustrate important features of the early American trade with China.

The sloop was built in the summer of 1784 at Albany for Stewart Dean, who had commanded several privateers during the recent war with England, and Teunis T. Van Vechten, a prominent Albany merchant. When eventually federally enrolled in the coastwise trade after returning from China, the *Experiment*'s dimensions were listed as length – 58 feet 11 inches, beam – 19 feet 3 inches, depth of hold – 8 feet 11 inches, register tonnage – 85½ tons.[2] The sloop cleared Albany in mid-July on her maiden voyage, carrying a full cargo of wheat and corn consigned to Shirley, Bangor & Company in Madeira. There, Dean loaded with wines and sailed to the West Indies, pausing en route at the Cape Verde islands to "fill [his] Deck with small Cattle." The wines and cattle were bartered for rum that was taken to Charleston, South Carolina, which the sloop left on 23 December for New York.[3]

Dean sold a one-third share of his vessel to the partnership of James Stewart and John Jones in early January 1785.[4] A financially dismal round trip voyage to Charleston followed: the owners netted less than £50 after paying all operating expenses. This they attributed to "the Kooped condition of the american Trade [which] at present is such that where formerly One American Vessell frequented that or any of the American Ports, there is now Ten, and every place is over Run & Glutted owing to our not having Liberty of the English West India Trade."[5] The *Experiment*, therefore, "was Chartered from here [New York] with Passengers for S^t Eustatia for £275 York money and there Discharged."[6]

The trade situation still had not improved by July 1785. Stewart & Jones wrote to Shirley,

Near-contemporary portrait of Stewart Dean, reproduced as the frontispiece in William J. Wilgus, *Life of Stewart Dean, A Character of the American Revolution* (Ascutney, VT, 1942).

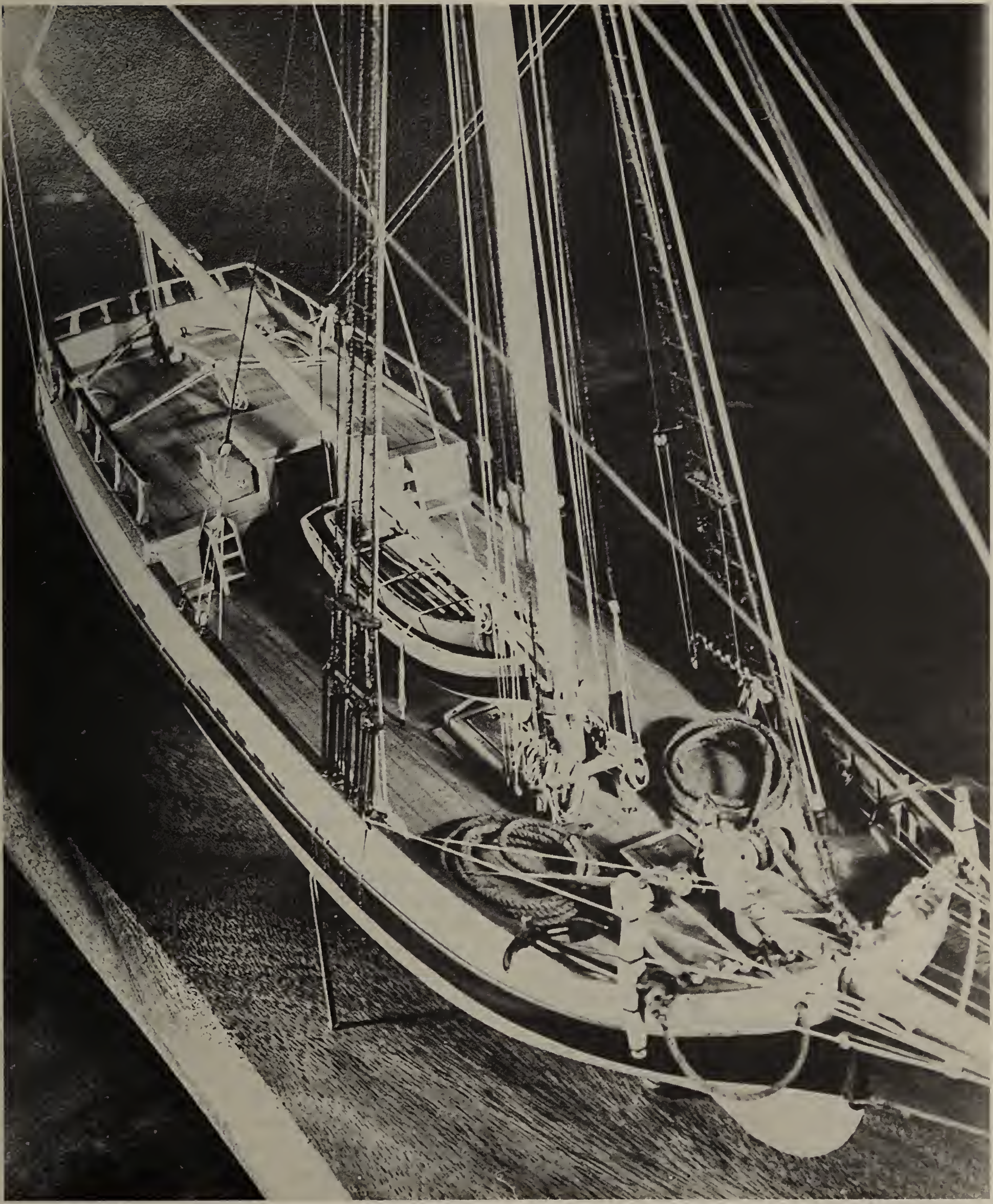
Bangor & Company that "The Sloop Experiment, Cap. Dean, we have chartered for Madeira @ 15$^{£}$ Sterling pr. ton burden to Messrs. Ins, Searle & Co of your Island, our not having a voyage at present for Dean and being confident we should not have a better offer of Freight induced us to close with I. S. & Co. We mean She shall call at the Isle of May for a load of Salt on her way back."[7] Dean finally returned to New York on 18 October, and a few days later Stewart & Jones wrote to Van Vechten that "respecting Dean's voyage to the East Indies it's not yet altogether fixed as yet. We are now looking up a good concern of which you will hear further from us when it is finally fixed."[8]

A little over three weeks later, on 15 November, a group of eighteen investors met at Bradford's Coffee House in New York and agreed "to fit out the Sloop Experiment Stewart Dean Master for Canton in China...the expences of Vessel & Cargo not to exceed the sum of £10,000 N.Y. Currency. We also agree that when fifteen shares are subscribed for this Business shall be carried into immediate Execution." Guilian Verplanck became their treasurer. Robert Dale, William Laight, and James Stewart joined him to form a committee to handle purchases and payments, and the subscribers decided to meet together each Tuesday in the coffee house at 6:00 P.M. to review their venture's progress.[9]

Seventeen subscribers, who included both individuals and small partnerships or firms, purchased a total of eighteen shares. Only Stewart & Jones subscribed for two shares. This firm, Stewart Dean, and Teunis T. Van Vechten, who were the joint owners of the *Experiment*, took up four of the original eighteen shares.[10] Furthermore, a business letter from Shirley, Bangor & Co. in Madeira indicates that, in June 1785, Stewart & Jones and two of the other shareholders, Peter Schermerhorn and Ten Eyck & Seaman, were operating in partnership.[11] This group thus formed no less than one-third of the total shareholding.

The day after the investors agreed to proceed with the venture, Stewart & Jones wrote Joseph Carson in Philadelphia asking him to ship them canvas duck and ginseng. "Its for Dean, of our Sloop Experiment for Canton. Our shares are all full."[12] This letter's contents are instructive, since they clearly demonstrate the two principal concerns of the new "India Company of Experiment" — fitting out their vessel and assembling a suitable cargo for the Chinese market. The first task was placed in Dean's capable hands. Under his supervision, carpenters raised the bulwarks, fitted gunports, and enlarged the stern cabin. A caboose for cooking was either fitted or, more likely, simply relined with new bricks. The carpenters also replaced defective planks and re-caulked the hull.[13]

Some extensive changes were made to the sloop's rig. Dean fitted a new, longer topmast, so that the *Experiment* could spread both a topsail and a topgallant. A jib-boom extended beyond the tip of the bowsprit to carry a flying jib. The new rig provided studding sail yards and booms for the square sail and topsail yards, and gear to hoist



A model made by Winthrop Pratt, Jr., topsail sloop *Experiment*, built at Albany, New York, in 1780. Photo Courtesy of Peabody Essex Museum.

a ringtail beyond the gaff mainsail. This rig gave the *Experiment* a very comprehensive suit of sails for light weather. There are two unusual features of the rig: both the fore staysail and the jib were fitted with bonnets rather than reefs, and one spar supplied was "a Studdin Sail Mast."[14] It is possible that this was fitted as an oversize ensign staff, as on some fully-rigged ships, but this seems unlikely since it would have obstructed the boom of the mainsail, so its employment remains mysterious.[15]

Since the *Experiment* was sailing into waters considered dangerous, the promoters were determined to protect their investment. They equipped the sloop with two ten-pounder carriage guns, twelve small arms, four blunderbusses, and two pairs of pistols, together with gunpowder and ammunition, to keep pirates at bay. The company purchased two brass compasses, one of which was "second hand," a "New Wood Compass," and "Charts of Directions for sailing to, from, and in the Indian Ocean" to navigate the sloop safely to China. A "Medsin chest" and supplies costing £7.7.0 were to take care of the crew's health.[16]

Procuring a suitable cargo posed a particular problem for the promoters because American merchants had little direct experience to draw upon in selecting the most likely items to sell well in Canton. The sole previous American venture, by the *Empress of China*, had taken out a mixed cargo including thirty tons of Appalachian ginseng, fifty tons of cordage, and thirty tons of lead, plus planks, cloth, and assorted wines and spirits. This had sold for just over $270,000; the ginseng alone accounted for $240,000. In addition, $20,000 in silver dollars had been shipped in casks to be used for further purchases.[17] Stewart & Jones' letter of 16 November makes it clear that the promoters of the *Experiment* voyage, from the start, viewed ginseng as the principal product to be shipped to China. The evidence of their weekly meetings at Bradford's reinforces this conclusion: on 29 November "It was ordered that if an addition of 2000 lb to the quantity of Ginseng already mentioned can be procured of a good Quality, that it may be purchased by the Committee," and a week later "That 6000 lb of ginseng be purchased even should the Shares exceed £600."[18] The cargo finally carried to Canton included 6,116¼ pounds of ginseng purchased from twelve different suppliers for a total of £1,164.5.5. "Boxes & Casks & Carting" cost a further £18.13.8, bringing the total expense to £1,182.19.1 (2957^{3}/_{8}$). [19] Stewart Dean sold this cargo of ginseng on 1 July 1786 to "Chouqua Hong Merchant" for $6,190½, the equivalent of £2,476.4.0. This was well below the boom levels prevalent in early 1784 which had been as high as $15 per pound, or even the price of $5 per pound realized for the *Empress of China*'s cargo.[20]

The appetite for the *Empress of China*'s alcoholic offerings seems also to have impressed the subscribers. Four hogsheads of "Jamaica Spirits," at £98.6.6, and four quarter casks of "Old Madeira Wine," for a further £62.3.0, were part of the *Experiment*'s cargo, but again the return was dismal — the rum sold for a little over $80 per hogshead and the Madeira for barely $50 — a gross profit of about £38 in total. Clearly, Chinese enthusiasm for Western wines and spirits had waned enormously during the previous two years: these exotic liquors had outworn their novelty.[21]

The subscribers also made a token gesture toward satisfying the Chinese taste for luxurious pelts by including a cask of assorted furs. This represented a minimal investment of only £15.14.0 ($39¼), but Houqua valued them at a mere $12. His opinion of the four casks of "best Scotch Snuff" was even lower: he paid $100 for the entire 1078 pounds that had cost the shippers £122.7.0 ($305⅞), while the sole cask of tobacco of the six they had loaded that was sold in Canton went for half its cost in New York.[22]

The remaining goods shipped to China were naval stores — 101 barrels of tar, ten barrels each of turpentine and rosin, five barrels of varnish, and two barrels of spirits of turpentine — that cost £130.4.2. These stores, together with anchor cables and one of the *Experiment*'s boats, were sold to other Western vessels in Canton. In all, the goods loaded aboard the sloop in New York cost the subscribers £1657.3.10 ($4143), and sold for $7549½. Captain Dean, however, incurred expenses of 4679^{40}/_{96}$ on the outbound voyage and while in Canton, of which $241 represented

View from the southwest of Fort George and the City of New York, a mid-eighteenth century engraving by J. Carwitham. *The Empress of China* sailed from here to the Orient in 1784. Courtesy of Peabody Essex Museum.

advances on pay to the crew. This drastically reduced the amount he had available for purchases of Chinese goods.[23]

The total "Invoice of sundries shipped on board The Experiment," however, was for £8,860.0.0. "Eighteen Boxes of Spanish Milled Dollars containing 1000 Dollars each" made up the difference.[24] The promoters of this second American voyage, given the uncertain reception of the items available for export to China, relied to an extraordinary extent upon the universal acceptability of specie to ensure a successful venture. Silver coin represented over eighty percent of the value of the cargo they shipped, compared with about twelve percent of the *Empress of China*'s cargo, which had cost £37,384.12.0.[25] The much smaller size of their vessel — the *Experiment* was about one-fifth of the *Empress of China*'s tonnage — may partially explain this huge difference, since the sloop did not have the capacity to transport a more balanced shipment. Nevertheless, it seems that the smaller scale of the venture, and its diverse shareholding, engendered a more cautious approach in assembling merchandise that could be sold profitably in Canton; silver was the only commodity they knew for certain was acceptable in China.

The subscribers gave Dean careful instructions:

> *On your departure from Newyork you are to proceed to Canton in China, touching at such places as you may Judge neccessary for Refreshment — Keeping in Mind at all times to use your best endeavours to compleat your Voyage as soon as possible.*
>
> *When you reach the Streights of Sunda, it is recommended to you to keep yourself always on your guard against the Natives of Java and the other Islands, and to endeavour to get through the Streights and to your destind Port as soon as you can....*[26]

Ginseng root. The Oriental belief in ginseng as an unexcelled aphrodisiac and panacea springs from the root's humanoid shape. Photo courtesy of Philip Chadwick Foster Smith.

To further expedite their venture, on 29 November 1785 the subscribers decided "that Mr. Alsop, Mr. Verplanck, & Mr. Stewart be a Committee to wait upon the Governor & Foreign Minister, to obtain from them such Certificates as may be beneficial in the prosecution of our Voyage." In this they were following the example of the promoters of the previous American voyage to China, although any documents which may have been issued seem not to have survived.[27]

On 18 December 1785, the *Experiment* slipped away from Murray's Dock on the East River in New York.[28] Contemporaries paid little attention to this departure: not one of the city's newspapers reported the sailing. Stewart Dean commanded the sloop, with John Whetten as his first mate, Isaac Seaman as second mate, and a crew of five men and two boys. William Stewart sailed as supercargo. One crew member, who shipped aboard on 24 November, was listed as "Black boy Prince" and clearly was not a slave, since he was paid £2 per month and earned £34.1.4 during the voyage.[29] They made a port-call at St. Iago in the Cape Verde Islands on 21 January 1786 for supplies, purchasing three pigs, two sheep, two goats, "Fowles for Stores," and "Greens for ships use."

The sloop arrived at Canton on 13 June 1786, having sailed around the Cape of Good Hope, across the Indian Ocean, and through the Java and China Seas.[30] Dean discovered in Canton that the Chinese assessed very high port charges at a flat rate of $3,166 and disregarded the size of the ship. This put his tiny vessel at a severe disadvantage in comparison with other American ships arriving after her and contributed to the low return realized on this venture.[31]

Dean's instructions continued:

> *On your arrival You are to dispose of Your Cargo to the best advantage, and should You be the first American Vessel in Port, the Sale of your Ginseng is most particularly to be attended to. In that case it will be adviseable to embrace the first Offer which You think sufficiently advantageous to the concerned.*
>
> *The proceeds of your Cargo are to be invested in the Articles enumerated in the List which will be furnished You: And should there be a deficiency in the proceeds to purchase all the Articles enumerated, You are to divide proportionally from such Articles as You Judge the least profitable, and should there be a surplus You are to make additional purchases of those Articles which You think will turn the best Account....*
>
> *If after compleating your Cargo You find yourself in a Situation to receive any Goods upon Freight, You are empowered to receive valuable piece Goods if consigned to the Owners. The freight to be paid there and invested in Goods. Before Your Departure you are to sign three Copies of your Invoice and Bill of Lading, and send Them by different Vessels to the Concerned, one by way of London, the other two direct to America, that there may be proof of Interest in case of Misfortune.*[32]

At about the same time, Stewart & Jones wrote to Thomas Powell in London regarding the problems they were encountering in purchasing insurance:

> *...on Sloop Experiment from New York to Canton & Back to N. York & have determined to give the 12 Guineas per Cent provided it cannot be effected at a lower premium....The risque we cannot conceive any way to be dreaded more than common upon other Vessels trading to those Ports having the greatest confidence in the Master & knowing the Vessel to be a good one....M^r^ Seaman has just received advice from his friend in London a M^r^ William Cowley Merch^t^ there of having effected the Insurance on his part of the vessel & Cargo at 10 per Cent. We would beg your calling upon M^r^ Cowley, he is to be heard of at the N. York Coffee house & who may tell you his men. We are in no way apprehensive of a loss in this business but should such a thing happen we might have occasion to reflect that our endeavours had not been exerted for the preservation of our property.*[33]

The homebound cargo purchased in Canton contained no surprises. Teas made up the major part — 308 chests of Hyson and 100 chests of Souchong. The *Experiment* also loaded "26 Chests of China Tea cups & Saucers ...5 Chests of Breakfast China," and "80 Bales of Nankeens." Dean obviously negotiated a premium on his Spanish dollars, since the entire cargo was valued at $20,939.[34]

The sloop departed Whampoa on 14 December 1786, again sailing around the Cape of Good Hope.[35] On 6 March 1787, they put into St. Helena and purchased three pigs and twelve chickens, and a second stop was made at St. Eustatia in the West Indies on 5 April for provisions, fish, and water.[36] On 22 April 1787, the little sloop entered New York harbor to scenes of great excitement, and "saluted the city by a discharge of 13 rounds. At the discharge of the last round one of the crew was unfortunately wounded by the match being applied before he had fully charged the piece, but we are assured that he will soon recover and that happily without loss of limb." Captain Dean also "brought home all the hands he took out with him, having had no sickness on board."[37] Soon after, Stewart & Jones wrote to Madeira that:

> *Our Sloop Experiment Stewart Dean Master arrived here 3 days since from Canton w^th^ a Load of Tea China & Nankeens. She will make a middle good Voyage we suppose after paying Insurance, will leave us 20 pr. Ct. at wholesale price....We are talking of letting her make a Voyage to Madeira but we have So many to advise with, at present is uncertain whether She will come or not.*[38]

Immediately after the return of their vessel, the sloop's owners were intent upon disposing of the cargo to best advantage. The partners met on 25 April and "agreed that the damaged Tea, the remains of the Tobacco & three pieces of Duck shall be immediately sold at Auction by M^r^ Jay – & that the Sloop with all her Tackle & apparil, as she came from Sea (as p^r^ Inventory) shall be sold at public Auction on Thursday 3 May next."[39] William Laight & Company were appointed to dispose of the bulk of the cargo and, soon afterwards, advertised

> *Have for SALE, on reasonable Terms for Cash, HYSON TEA of the first quality, SOUCHONG TEA, superior to any hitherto imported, NANKEENS, large pieces, and of the finest kind, CHINA WARE, elegant patterns, pencilled in gilt. Imported in the Experiment, Capt. Dean, just arrived from China.*[40]

The "General Account & Final Settlement of the Sloop Experiment" indicates that the voyage was not very profitable, returning only about eight percent. There is reason, however, to believe that the "Final Settlement" understates the success of this voyage, since several of the original investors came together to promote a second venture. They were joined by some fresh partici-

Whampoa Reach, ca. 1800. While supercargos attended to their businesses in Canton, the trading ships remained in Whampoa. Courtesy of Peabody Essex Museum.

pants, among them John Vanderbilt, Thomas Ludlow, and John G. Leake. On 22 October 1787, they met and concluded:

> *It being presumed that an Advantageous Adventure may be made to China if undertaken with prudence & managed with Economy, The Subscribers do hereby agree to associate for the purpose of fitting out a proper, tho small, Vessel, to be commanded by Capt Stewart Dean, on a Voyage to Canton — The Experience & skill of such a Master must give Confidence to every one concerned, more especially, as both his Property & Person will be hazarded with the Property of each Subscriber.*

They went on to agree to invest £1,000 apiece, with the total subscription to be not less than £20,000, and those present pledged themselves to 12½ shares on the spot.[41]

William Laight subsequently prepared two projections for the promoters. One he based on again employing the sloop *Experiment* for £2,200, the other on purchasing a "Brig of 150 tuns" for £3,500. The cargoes in each case were to be virtually identical: 30,000 pounds of ginseng purchased at five shillings per pound (£7,500), 20,000 silver dollars (£8,000), and the balance of the £20,000 in total available capital to be spent on "Madeira Wine & other Goods" (£2,300 and £1,000 respectively). He projected net profits at the completion of the two-year voyage of £10,529.16 using the *Experiment* or £9,294.16 if the brig were employed.

Later, Captain Robert Dale prepared a separate projection using only the 12½ shares pledged already. He was even more sanguine in his calculations: the initial £12,500 investment was expected to generate net profits of £16,294 from a very similar cargo mix in which the ginseng was to be reduced to 6,000 pounds.

It is significant that, in all these projections, the investors expected to make far more substantial profits in New York from the sale of the Chinese goods brought back to the United States than from the sale of American goods in Canton. Laight expected to make only about sixteen percent profit in Canton but over eighty-eight percent in New York, while Dale projected thirty-five percent and 108 percent respectively. Given that William Laight was responsible for the sale of the *Experiment*'s cargo, it is difficult to accept that he could have so grossly overestimated the retail value of Chinese products in the New York market. This leads one to suspect the first voyage was more profitable than it appears to have been at first sight, particularly since the majority of the partners in the new venture had participated in the *Experiment*'s original voyage and would be well aware of their previous earnings.[42]

Despite these rosy projections, the promoters were unable to generate sufficient further interest, and the venture lapsed. The *Experiment* reverted to the Albany–New York trade and became one of the more popular vessels on which to take passage. Michel-Guillaume St. Jean de Crèvecoeur, the author of *Letters from an American Farmer* and also the French consul in New York, traveled to New Windsor aboard this vessel.

> *Several reasons made us prefer this sloop to those that customarily plied the river: the fineness of its construction, the unusual comfort of its staterooms, and especially the hope that the conversation of Captain Dean, who had just returned from a voyage to China in that same sloop, would be interesting. We were not mistaken; he told us that if the Chinese customs at Canton had demanded a sum proportionate to the size of his ship, he would have made a profitable trip....[The stateroom] was furnished in Chinese fashion, lighted by candles from that same land, each in its wide-mouthed, short-necked bottle.*[43]

Chocolate pot brought from China for Elias Haskett Derby during the same period as the *Experiment* voyage. Photo courtesy of Peabody Essex Museum.

The voyage of the sloop *Experiment* is valuable in illustrating a number of prominent features of the early American trade with China. Financing the venture was diffuse: the "India Company of Experiment" comprised seventeen individual or company shareholders who subscribed to nineteen shares of a little over £600 each to raise its total capital of £11,430. Simultaneously, individual risks were minimized and the relatively large investment necessary for the venture was raised rapidly. It is worth noting that only thirty-three days elapsed between the first meeting of the participants and the *Experiment*'s departure from New York; eighteenth-century businessmen were capable of remarkably decisive and enterprising action.

A second characteristic feature was the venture's self-contained nature. Once the voyage was completed, the partnership was dissolved and all its assets sold and distributed. Those participants who wished to follow up the enterprise had to form a fresh partnership on similar lines, as occurred in this instance. The vessel and its commander might be the same, as also with the second voyage of the *Empress of China* and Captain John Green, but the company's composition would have changed.

Although most future U.S. vessels in the China trade would be larger than the *Experiment*, the sloop's size typified American merchants' preference for using much smaller ships than the massive European East Indiamen. During the first thirty years of U.S. trade with Canton, the majority of American ships were under 400 tons, while very few approached the size of their European competitors.[44] Initially, relatively limited capital availability inhibited American merchants from employing large vessels with greater cargo capacity because of their excessive expense and risk. Experience later led them to deliberately select smaller vessels as more suitable for the trade: a 400-ton ship was more economical to operate, handier in confined or inadequately charted waters, and offered a faster turnaround.[45]

The over-riding problem facing American merchants was their search for goods suitable for the Chinese market, so as to minimize the quantity of specie they had to ship to Canton. China's economic self-sufficiency rendered this a formidable task, which was exacerbated by Chinese fickleness; a market could evaporate without warning. The *Experiment*'s promoters discovered this with rum and Madeira, and the ginseng market collapsed by 1790–91, when prices fell to 35 cents per pound, prompting British East India Company officials to complain that "Since the Independence of America of which country Ginseng is the product so much has been sent that the Chinese pretend to have discovered that it has no Virtue, and it is actually become unsalable."[46] This cycle of boom and bust in the marketability of commodities remained a feature of the American trade with China into the 1840s.

Finally, the voyage of the *Experiment* epitomizes the eagerness with which Americans embraced foreign trade after independence. In early December 1786, the following vessels were "lying at Whampooe, at Captain Dean's departure. American Ships. *Empress of China*, [John] Green, New-York; *Canton*, [Thomas] Truxton [Truxtun], Philadelphia; *Hope*, [Jonas] M'Gee, New-York; *Grand Turk*, [Ebenezer] West, Salem," all of which had cleared from the United States during that year. The same newspaper report clearly portrays the views of these contemporary merchants.

> *It was a matter of surprise to the natives, and Europeans in that quarter, to see so small a vessel arrive from a clime so remote from China; and must have given them an exalted conception of the enterprizing spirit of the citizens of these United States. The successful and safe return of Captain Dean, has taught us, that fancy oft times paints danger in much higher colours than is found really to exist, and that by maintaining a spirit of enterprize, diligence and activity, we are enabled to surmount difficulties, which, on a cursory view, are deemed fraught with dangers.*[47]

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Notes

1. The most thorough account of this first voyage is given in Philip Chadwick Foster Smith, *The Empress of China* (Philadelphia: Philadelphia Maritime Museum, 1984). See also Clarence L. Ver Steeg, "Financing and Outfitting the First United States Ship to China," *Pacific Historical Review* 22 (1953), 1–12, and William Bell Clark, ed., "The Journal of the *Empress of China*," *American Neptune*, 10 (1950), 83–107, 220–229, 288–297, and 11 (1951), 59–71, 134–144.
2. Two building sites have been put forward: near the Eagle Tavern by George Coggeshall, *An Historical Sketch of Commerce and Navigation* (New York: G. P. Putnam, 1860), 53, or in Dean's own garden by Richard Henry Greene, *Todd Genealogy* (New York: Wilbur & Hastings, 1867), 29. For ownership, see Dean to John Jones, 26 May 1784, Stewart & Jones Letters Received 1771–1820, New York Public Library, and Jones to Van Vechten & Dean, 12 July 1784, Stewart & Jones Letter Book 1780–1786, New York Public Library. Dimensions from U. S. Customs Service – Records for the Port of New York (RG36), National Archives, Washington, DC. Any New York State documents that may have existed before Federal enrollments were introduced in 1789 were destroyed by the fire at the New York State Library in 1833, so the earliest documentation for the sloop to survive pertain to the period it was operating on the Hudson River after returning from China.
3. Jones to Van Vechten & Dean, 12 July 1784, Stewart & Jones Letter Book 1780–1786, Dean to James Stewart, 22 Dec. 1784, Stewart & Jones Letters Received 1771–1820.
4. Stewart & Jones to Van Vechten, 12 Jan. 1785, Stewart & Jones Letter Book 1780–1786.
5. Stewart & Jones to William Stewart (James Stewart's cousin in New London), 13 Apr. 1785, Stewart & Jones Letter Book 1780–1786.
6. Stewart & Jones to Joseph Carson of Philadelphia, 6 June 1785, Stewart & Jones Letter Book 1780–1786.
7. 12 July 1785, Stewart & Jones Letter Book 1780–1786.
8. Dean's return was noted in Stewart & Jones to Messrs. Jacob Lansing Jun., Guysbert, & Abraham Fonda of Albany, 18 Oct. 1785, and the voyage to China discussed on 24 Oct., Stewart & Jones Letter Book 1780–1786.
9. Article of Agreement between the Owners of the Sloop Experiment, The Cost, Outfit, Cargo and Disbursements of the Sloop Experiment, Stewart Dean Master, of 80 Tons Burthen on a Voyage from New York to Canton and Back, New-York Historical Society, hereafter referred to as *Outfit*.
10. Articles of Agreement, *Outfit*.
11. Shirley, Bangor & Co. to Stewart & Jones, 16 June 1785, Stewart & Jones Letters Received.
12. 16 Nov. 1785, Stewart & Jones Letter Book 1780–1786.
13. Sixteen shillings were paid to a mason for "Lining a Cambouse with Stuff." Two scows and a crab [crane] were hired by Samuel A[c]kerly while his gang of carpenters was working on the *Experiment*, indicating that some of the men were working over the side. Mason for Cabouse, and S. Ackerly, Carpenter, *Outfit*.
14. Data from S. Ackerly, Carpenter, E. Young, Ship Carpenter, and G. Warren, Sail Maker, *Outfit*.
15. There has been extensive correspondence on this issue in reference to Continental frigates in *Nautical Research Journal*, 37 (1992), 116–117, 244–249. See also Antoine Lescallier, *Traité Pratique du Gréement des Vaisseaux* (Paris: chez Clousier, 1791), vol. 2, Plate XII, and William Hutchinson, *A Treatise on Naval Architecture*, 4th edition (Liverpool: T. Billinge, 1794), Frontispiece and Plate I.
16. Guns, Small Arms, Pistols &c, T. Biggs Mathematical Instruments, Charts & Directions, Doctors Bill, *Outfit*.
17. John Holker Papers 1777–1822, reel 15, folio 5888, Library of Congress, Washington, DC. Of the other items, only the wines and spirits sold well, five pipes of Madeira fetching $400 each.
18. Article of Agreement, *Outfit*.
19. Invoice of sundries shipped on board The Experiment, *Outfit*. The accounts use a rate of $1 = 8/–, or $2½ = £1. Also, amounts less than $1 were shown as fractions, since each dollar contained 96 cents.
20. Sales of sundries, *Outfit*. Smith, *The Empress of China*, 155.
21. Invoice of sundries shipped on board The Experiment, and Sales of Sundries, *Outfit*.
22. Invoice of sundries shipped on board The Experiment, and Sales of sundries, *Outfit*. The furs were truly an assortment: 1044 gray, black, red, ground, and flying squirrel skins, 10 minks, 3 red and 3 gray foxes, 3 "Wild Catts," 1 "Martin," 1 bear, 6 raccoons, 6 "muskratts," and 4 spotted fawns, all purchased from Abraham Willson 11 Dec. 1785, Acct. of Furrs, *Outfit*.

23. Invoice of sundries shipped on board The Experiment, and Sales of sundries, *Outfit.*
24. Invoice of sundries shipped on board The Experiment, and Bill of Lading, *Outfit.*
25. Holker Papers, Benjamin Franklin Collection, Sterling Memorial Library, Yale University, New Haven, CT.
26. Capt. Dean's Instructions, *Outfit.*
27. Articles of Agreement between the Owners of the Sloop Experiment, *Outfit.* Smith, *The Empress of China*, 69–72.
28. Date of departure noted in Stewart & Jones to Hans Crevey, 21 June 1786, Stewart & Jones Letter Book 1780–1786.
29. Portage Bill – Sloop Experiment, *Outfit.*
30. Rhys Richards, "United States Trade With China, 1784–1814," *American Neptune*, 54 (1994) Special Supplement, 10.
31. Sl. Experiment's Disbursements, *Outfit.*
32. Capt. Dean's Instruction, *Outfit.*
33. 8 June 1786, Stewart & Jones Letter Book 1780–1786.
34. Invoice of [goods]...ship'd on board the Sloop Experiment at Canton in China by Stewart Dean on acc^{t} & risque of Mess^{rs} Stewart Jones & co of New York. *Outfit.*
35. Richards, "United States Trade," 10.
36. Experiment's Disbursements, *Outfit.*
37. *New-York Journal and Weekly Register*, 26 Apr. 1787. New York *Independent Journal*, 25 Apr. 1787.
38. Stewart & Jones to Shirley, Bangor & Company, 23 Apr. 1797, Stewart & Jones Letter Book 1787–1795, New-York Historical Society.
39. Transactions at a Meeting of the Owners, *Outfit.*
40. New York *Independent Journal*, 2 May 1787.
41. Meeting at New-York, written by William Laight, *Outfit.*
42. William Laight's calculations, and Capt. Dale's calculation, *Outfit.*
43. Michel-Guillaume St. Jean de Crèvecoeur, *Journey into Northern Pennsylvania and the State of New York*, translated by Clarissa Spencer Bostelmann (Ann Arbor: University of Michigan Press, 1964), 117,125.
44. The only American ships close to the size of East Indiamen to call at Canton were the *Massachusetts* (820 tons) in 1790 and the *America* (700 tons) in 1809. Richards, "United States Trade," 13, 57.
45. Great Britain, Parliament, *Sessional Papers: 1821* (Dublin: Irish University Press Area Studies, 1971) 7:61–62, Great Britain, Parliament, *Sessional Papers: 1830* (Dublin: Irish University Press Area Studies, 1971) 6:371, 487–489.
46. Brian L. Evans, "Ginseng: Root of Chinese–Canadian Relations," *Canadian Historical Review*, 66 (1985), 21–23. Second Report of the Select Committee appointed to take into consideration the Export Trade of Great Britain to the East Indies, *House of Commons Sessional Papers of the Eighteenth Century*, 91, *East India Co., 1793–96*, Sheila Lambert, ed. (Wilmington, DE: Scholarly Research, 1975), 57.
47. New York *Independent Journal*, 25 Apr. 1787. Italics added to ship's names.

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Naval History of the Ojibwa of Lake Superior

D. PETER MACLEOD

Naval warfare and amphibious operations are not generally associated with the Native Americans of the upper Great Lakes.[1] Nonetheless, when rival groups find themselves in competition for maritime and littoral resources, control of movement over bodies of water is as essential for peoples who use canoes as for builders of triremes or aircraft carriers. This is particularly evident in the history of the Ojibwa of Lake Superior.

Writing in the mid-nineteenth century, Ojibwa author Francis Assikinack said of the naval heritage of his nation that:

> *Generally speaking...[the Ojibwa] dwelt in villages, and their favorite seats appear to have been eminences on the borders of lakes, and along the banks of rivers, so that in case of a hostile invasion they would have only one side of their village to defend and not be cut off from the supply of water.... Notwithstanding the precaution to prevent their being surrounded, the villagers were often obliged to meet the enemy on the water in their canoes, made of elm bark or hide; and they thought as much of their naval engagements and victories as the Navy of England of their achievements at the present day.*[2]

The greater part of the naval history of the freshwater seas now known as the Great Lakes is based upon documents produced by contemporary observers. Use of this material has produced a solid record of European maritime activities in the Great Lakes area. This is a limited history, which generally takes little account of Native Americans. There are, however, alternatives to documentary evidence. No less than Europeans, Native Americans are possessed of a keen historical sense. Events which contemporary Native Americans consider to be of importance were remembered by tribal elders and transmitted orally from generation to generation, until this history was finally preserved in print by literate Ojibwa during the nineteenth century.[3] This material is of considerable value for historians of the Great Lakes because the Ojibwa were one of the dominant cultures in much of the Great Lakes region until the arrival of European settlers after the American Revolution.

At the beginning of the seventeenth century, the Ojibwa resided on Manitoulin Island and the north shore of Lake Huron. From there, one element of the nation spread westward to the Sault Ste. Marie area and the north and south shores of Lake Superior. The principal Ojibwa community in this region was on the island of La Pointe, in Chequamegon Bay.[4] There they lived primarily by fishing, using spears and nets made from nettle fibers and the inner bark of basswood and cedar trees, by hunting, by harvesting wild rice, and by cultivating corn, beans, and squash.[5]

The Ojibwa migration had displaced the original Fox and Dakota inhabitants of the

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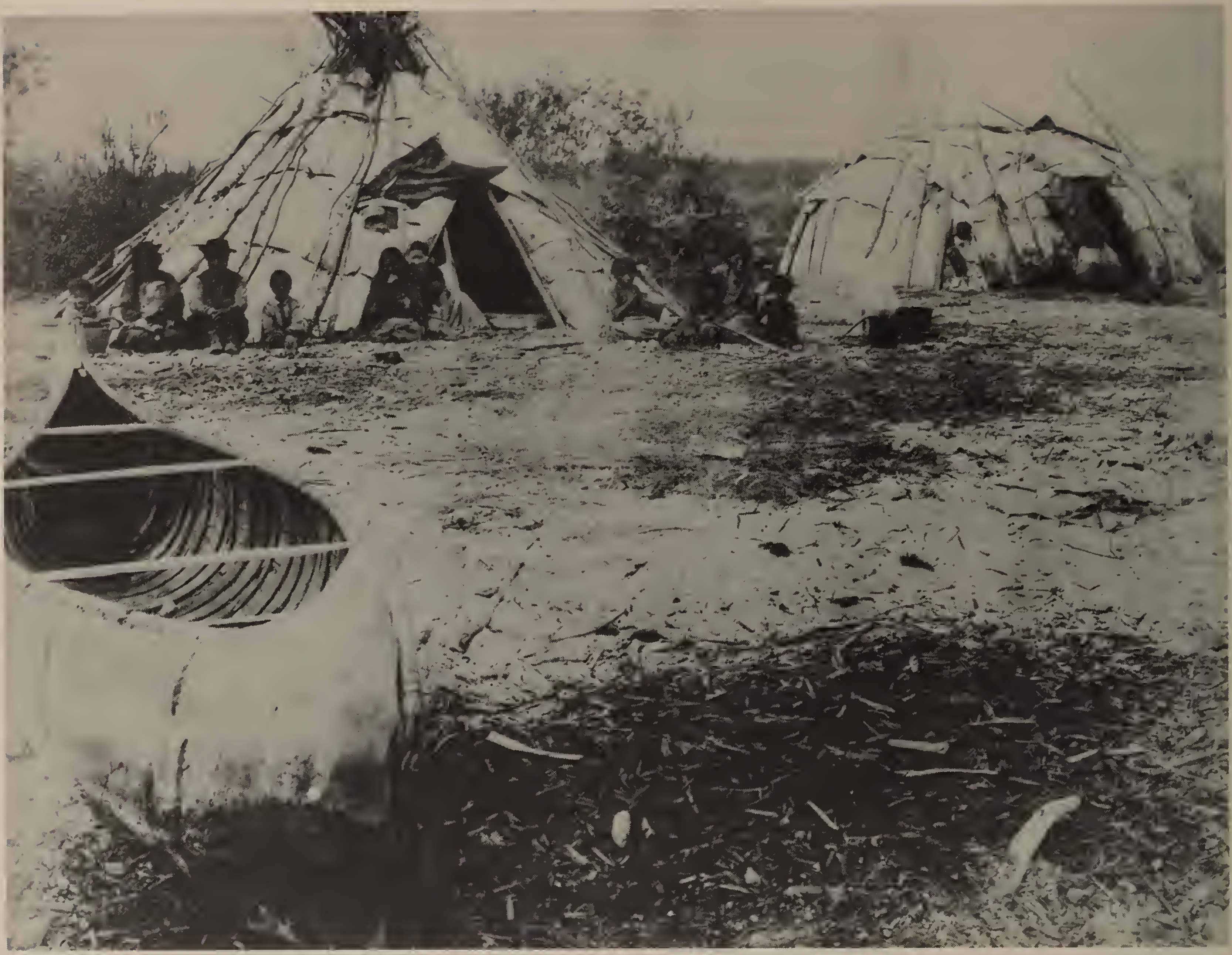


Ojibwa canoe and wigwams. This photograph gives a clear view of both the internal and external construction of the type of canoe used by the Ojibwa in naval warfare and the homes that they defended. *Ojibway Indian Camp at Jackfish River near Lake Winnipeg, 1884*, photograph by T. C. Weston. Photograph courtesy of the National Archives of Canada. Photographic negative number PA50793.

region.[6] However, the Ojibwa's relationship with these nations remained reasonably amicable until the eighteenth century.[7] At that time, they began a prolonged expansion to the south that would vastly increase the territory under their control and continue until they collided with the American settlement frontier. This territorial expansion, noted by nineteenth century Ojibwa author George Copway, brought the Ojibwa into conflict with the Fox and Dakota for "the right of occupancy of the fisheries at the upper end of Lake Superior, and the right to the game of the adjacent woods."[8] Two major engagements of these conflicts took place on the lake itself.

In the first decades of the eighteenth century, the Fox found themselves under pressure from the Ojibwa, who were expanding into the territory along the Ontonagon, Wisconsin, Chippewa, and St. Croix Rivers.[9] The Fox resisted this intrusion, both within the contested territory and by making a major attack on the Ojibwa at La Pointe. In the course of this operation, four hundred Fox traveled in canoes down the Ontonagon River, then turned westward and proceeded along the south shore of Lake Superior to La Pointe Island.[10] They landed at night unobserved, covered both by darkness and a heavy fog. At dawn, four young Ojibwa women were surprised while gathering firewood and were taken prisoner. The raiders then withdrew to their canoes and, still concealed by the fog, turned eastward to return to their homes, apparently victorious. They elected, however, to indulge in a shout of triumph, followed by a

Ojibwa canoes in the Saint Mary's River. Canoes like these, used here for fishing, were also used by the Ojibwa in their naval engagements. *Fishing at Sault Ste. Marie Ontario, 1869*, watercolor over pencil by William Armstrong. Courtesy of the National Archives of Canada. Photographic negative number CI14501.

rather tactless victory song. This alerted the Ojibwa, who launched their canoes and set out in pursuit.[11] Cloaked by the mist and guided by the laughter and chatter of the Fox, the Ojibwa followed silently. The younger men were eager to attack immediately. The enthusiastic warriors, however, were restrained by the war chiefs, until they had pursued their enemies to a stretch of coast where a rugged shoreline faced with steep rocks would make escape by land more difficult for the Fox.[12] Here, they struck with great effect. Ojibwa canoes "were made large and strong, sitting firmly on the water, made to withstand the storms of Lake Superior, and capable of holding from five to twenty men each."[13] The much smaller canoes of their enemies, on the other hand, were designed for river travel and crewed by only two or three people. They could be carried over a long portage by one person, but were comparatively light, fragile, and unstable.

In this, the first and last naval battle recorded in their oral tradition, the Ojibwa were completely successful. The Ojibwa in their heavier lake canoes easily overcame the flimsy craft of their enemies. As the Fox floundered helplessly in the water, they were killed without difficulty with war clubs.[14]

Rather than attributing their victory to inherent prowess or courage, the Ojibwa credited greater numbers and heavier canoes.[15] They might have added superior discipline and tactics. The display of ill-timed glee that betrayed the presence of the Fox contrasts sharply with the long, silent pursuit of the Ojibwa, who shadowed their adversaries until they reached that position where their attack would be most effective.

The second major adversary for the Ojibwa were the Dakota. Peaceful commerce between these nations ended in the 1730s as the Ojibwa pushed south and west into what is now Wisconsin and Minnesota.[16] Like the Fox, the Dakota responded with attacks on La Pointe. On one occasion, a party of Dakota concealed themselves on the mainland opposite the west end of La Pointe Island.[17] During the night, two warriors swam to the island by pushing a log. They landed safely, killed four members of a family who were fishing by torchlight on the east shore, stole the family's canoe, and returned to the mainland. Ojibwa pursuit the next morning was fruitless.[18] This is the only example of a direct attack on La Pointe Island by the Dakota that entered the Ojibwa oral tradition, and it may have been atypical or exceptional.[19]

A larger Dakota expedition, estimated by the Ojibwa to number about one hundred fifty, resulted in a more serious engagement. The Dakota fighters made their way to the tip of Chequamegon Point, three kilometers from La Pointe. Confined to the mainland by their lack of canoes, the raiders waited for Ojibwa victims to come to them. Patience was rewarded when, one morning, two youths crossed to the peninsula to hunt ducks. As they stepped ashore, the Dakota trap sprang. The hunters managed to evade capture for a time by dodging among the sand hills and oak and pine groves that covered the peninsula. Across the strait, the Ojibwa were alerted by shouts and war cries. Armed with bows, spears, and war clubs,[20] the Ojibwa warriors quickly assembled and prepared for action. Unlike the Dakota, they had the advantage of the superior mobility of water transport, which they proceeded to use to great effect. One group crossed directly to the tip of the point. They were too late to save the young men, but managed to engage the Dakota, who were now attempting to withdraw. Outnumbered by the Ojibwa, the Dakota fled southward.

In the meantime, the main body of the Ojibwa had landed two miles below the tip of the point — it was only thirty yards wide — and placed themselves where they would cut off the retreat of the Dakota. When the Dakota encountered the blocking force, they withdrew to an oak grove and resisted until overwhelmed. Only two of the raiders escaped by swimming across Chequamegon Bay.[21]

The Ojibwa had inflicted a serious check upon their adversaries by using water transport to effect an amphibious movement that trapped and destroyed the Dakota raiding party. By occupying the tip of the peninsula, the Dakota had placed themselves in a position where movement by water could be used to maximum effect, and the Ojibwa response was devastating.

Throughout their prolonged war with the Dakota, the Ojibwa consistently profited from the failure of their adversaries to use canoes to travel to Ojibwa territory. An American missionary who lived among the Dakota in the nineteenth century reported that "They [the Dakota] said they were obliged, when invading the Ojibway country, to make long and toilsome marches on foot, carrying their weapons and provisions, and were exhausted when they most needed to be rested and refreshed."[22] It is possible that the Dakota left their canoes behind when they went to war because they found these vessels, made "from the trunks of trees, with no tools but an axe and a little clumsy adze," to be awkward to carry over long portages.[23] Whatever their reasons, this practice conceded a considerable advantage to the Ojibwa.

The Ojibwa emerged triumphant from their engagements with the Dakota and Fox largely through technological superiority. In two important battles, they enjoyed the not inconsiderable advantage of outnumbering the enemy, but their ability to bring this preponderance to bear came from sea power. Mere possession of a maritime transport capability allowed them to trap and destroy a major war party of the hitherto elusive Dakota. Larger and heavier canoes proved decisive against the Fox. As any student of military tactics knows, a technical advantage alone will not guarantee victory if it is misused. The handling by the Ojibwa of their naval assets was flexible and imaginative. Rather than charging headlong at their enemies or indulging in elaborate formal displays, they maneuvered skillfully prior to battle to place themselves in the most advantageous position possible. Once engaged, they employed intelligent and effective tactics.

For the Ojibwa participants, their engagements with the Dakota and Fox ranked among the most important events of their lives.[24] Among the Ojibwa, noted Francis Assikinack:

> *It was customary to give a new name to the warrior who had distinguished himself most in their naval battles, as an honour and reward for his daring deeds, and to commemorate the event.*[25]

Deemed worthy of preservation for posterity, Ojibwa accounts of battles with the Dakota and Fox entered the oral tradition and survived until the present day to provide detailed narratives of Native American naval operations on the Great Lakes.

Ojibwa narratives represent these encounters as securing the command of Lake Superior for their nation.[26] After each battle described in these narratives, the decisively defeated Fox or Dakota ceased to challenge the Ojibwa on the Lake. This may have been the case. However notable the Ojibwa maritime victories may have been, they were but incidents in a long series of encounters with the Fox and Dakota. In neither conflict did ultimate victory come from the unaided efforts of the Ojibwa on land or sea. The Fox were overcome by a coalition of Native American nations of the Great Lakes region and the French.[27] Recent research suggests that the Dakota, in withdrawing from the contested territory south of Lake Superior, were motivated at least as much by economic opportunities on the plains as military and naval pressure from the Ojibwa.[28] The significance of these engagements for naval historians lies not with decisive results, but rather with the insight which they provide into the conduct of naval war on the Great Lakes by Native Americans.

The documented history of the Great Lakes commences only with travel by Europeans to the region in the first decades of the seventeenth century. Native American oral traditions make it possible for historians to extend the naval history of the Great Lakes beyond those times and places delimited by the presence of literate Europeans, and help to make this a history not just of Europeans, but of all the peoples whose vessels have plied North America's inland seas.

Native American oral traditions make it possible for historians to extend the naval history of the Great Lakes beyond those times and places where Europeans were present, and provide a history not just of Europeans, but of all of the peoples whose vessels have plied North America's inland seas.

* * *

D. Peter MacLeod is presently completing a history of the Canadian Iroquois in the Seven Years' War for the Canadian War Museum's Historical Publications series.

Notes

1. Research on Algonkian naval warfare has thus far been confined to the Micmacs of the Atlantic coast. Olive P. Dickason, "La «guerre navale» des Micmacs contre les Britanniques, 1713-1763," in Charles A. Martijn, ed., *Les Micmacs et la mer*, (Montreal: Recherches amérindiennes au Québec, 1986), 233-248. For an example of the use of traditional Native American narratives as sources for the history of the Great Lakes: Ives Goddard, "Reflections of Historical events in some Traditional Fox and Miami Narratives," in William Cowan, ed., *Papers of the Sixteenth Algonquian Conference* (Ottawa: Carleton University, 1985), 47-62.
2. Francis Assikinack, "Legends and traditions of the Odahwah Indians," *The Canadian Journal of Industry, Science, and Art*, vol. 3, no. 14 (March, 1858), 119.
3. Although in the nineteenth and part of the twentieth century this material was largely rejected or ignored, in recent years traditional Ojibwa narratives have become increasingly important as sources for historians. W. J. Eccles, "Sovereignty Association, 1500-1783," *Canadian*

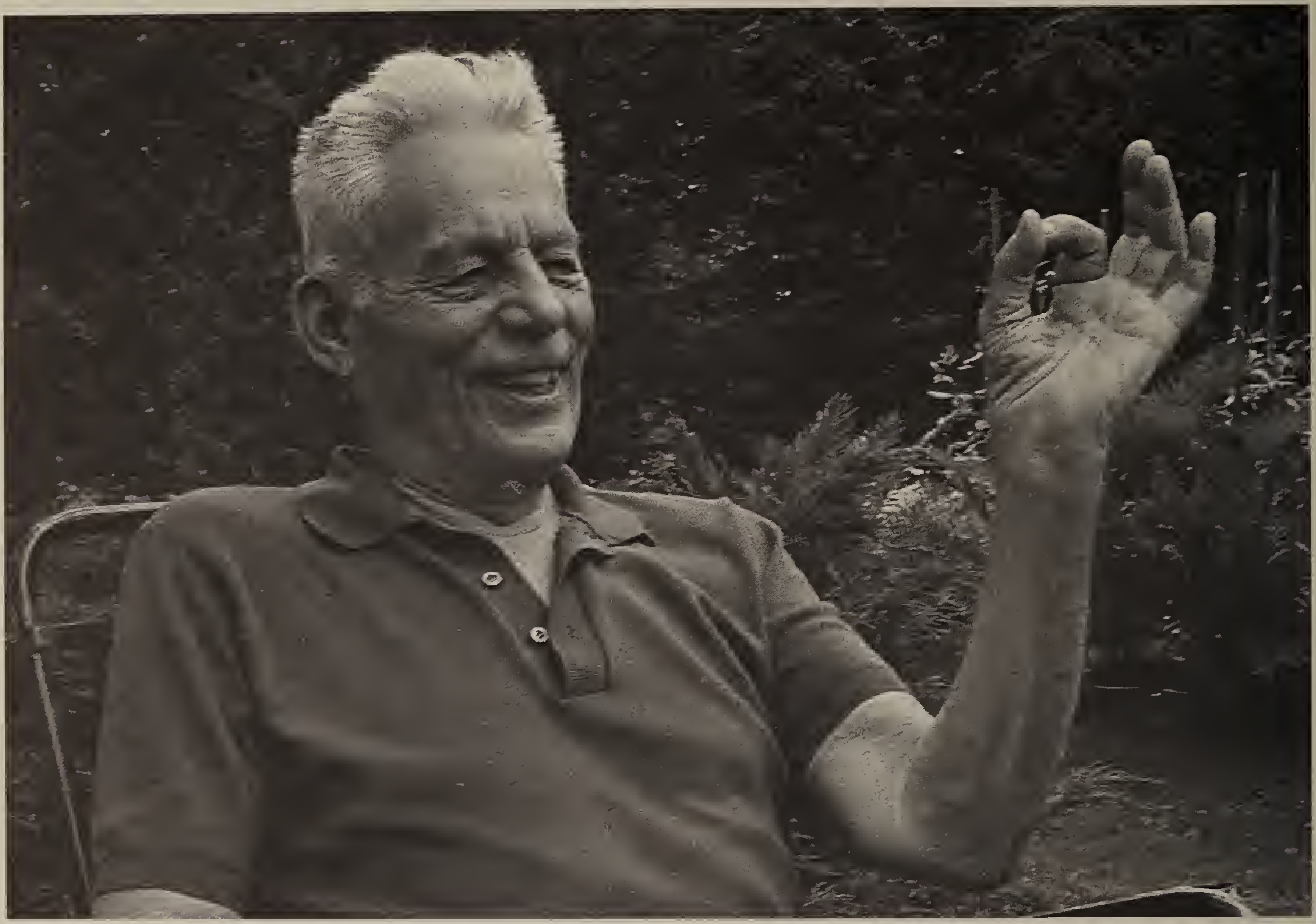
Historical Review, vol. 65, no. 4 (December, 1984), 486; Tim Holzkamm, "Eastern Dakota Population Movements and the European Fur Trade: One More Time," *Plains Anthropologist*, vol. 28, no. 101 (August, 1983), 231; Francis Jennings, *The Ambiguous Iroquois Empire: The Covenant Chain Confederation of Indian Tribes with English Colonies from its beginnings to the Lancaster Treaty of 1744* (New York: W. W. Norton, 1984), 21-22; D. Peter MacLeod, "The Anishinabeg Point of View: The History of North America to 1800 in nineteenth century Odawa and Ojibwa Historiography," *Canadian Historical Review*, vol. LXXIII, no. 2 (June, 1992), 194-210; D. Peter MacLeod, "The Native American Discovery of Europe: Accounts of First Contact in Anishinabeg Oral Tradition," in Chad Gaffield, ed., *The Invention of Canada: Readings in Pre-Confederation History* (Toronto: Copp Clark Longman, 1994), 53-59; Peter S. Schmalz, "The Role of the Ojibwa in the Conquest of Southern Ontario, 1650-1701," *Ontario History*, vol. 76, no. 4 (December, 1984), 327-328; Donald B. Smith, "The Life of George Copway or Kah-ge-ga-gah-bowh (1818-1869) — and a review of his writings," *Journal of Canadian Studies*, vol. 23, no. 3 (fall, 1988), 5, 30, 38.

4. Called by the Ojibwa Mon-ing-wun-a-kaun-ing (place of the golden-breasted woodpecker), the island is better known by its French appellation of La Pointe. Renamed Madeline Island (Wisconsin) by American settlers, it is the largest of the Apostle Islands group. William W. Warren, *History of the Ojibway People* (St. Paul: Minnesota Historical Society, 1885, reprinted St. Paul: Minnesota Historical Society Press, 1984), 96; Hamilton N. Ross, *La Pointe: Village Outpost* (St. Paul: North Central Publishing Company, 1960), xv-xvii.
5. Robert E. Ritzenthaler, "Southwestern Chippewa," in Bruce G. Trigger, ed., *Handbook of North American Indians, volume 15: Northeast* (Washington: Smithsonian Institution, 1978), 744, 746-747; Warren, *History of the Ojibway People*, 96-97. For some details regarding Ojibwa hunting, fishing, and agriculture: Frances Dunsmore, *Smithsonian Institution, Bureau of American Ethnology, Bulletin 86: Chippewa Customs* (Washington: United States Government Printing Office, 1929), 39-40, 42-44, 119-131, 152-154.
6. Edmund J. Danziger, *The Chippewas of Lake Superior* (Norman: University of Oklahoma Press, 1978), 26.
7. Harold Hickerson, *The Chippewa and their Neighbours: A Study in Ethnohistory*, revised and expanded edition (Prospect Heights, Illinois: Waveland Press, 1988), 65-66.
8. George Copway, (Kahgegagahbowh), *The Traditional History and Characteristic Sketches of the Ojibway Nation*, (London: Charles Gilpin, 1850, reprinted Toronto: Coles Publishing Company, 1972), 55.
9. Danziger, *The Chippewas of Lake Superior*, 33.
10. Once again, this is an Ojibwa estimate.
11. The Ojibwa traditionally used flute music as an alarm signal. Flutes were normally employed by young men "to attract or please" young women. But one warrior was entrusted with a special flute, which was played when word came that an enemy was nearby. This enabled the Ojibwa to raise the alarm without alerting their foes. Dunsmore, *Chippewa Customs*, 167-169.
12. The engagement took place about two kilometers below the mouth of the Montreal River, thirty-five kilometers from La Pointe Island.
13. Warren, *History of the Ojibway People*, 105. Ojibwa canoes: Edwin Tappan Adney, Howard. I. Chappelle, *The Bark Canoes and Skin Boats of North America* (Washington: Smithsonian Institution, 1964), 122-131; Dunsmore, *Chippewa Customs*, 150-152. A missionary who lived among the Ojibwa of Lake Superior in the nineteenth century reported that "we see bark canoes from 8 or 10 to 40 and 50 feet long." Frederick Baraga, "Answers to the 'Inquiries respecting the History, present conditions and future prospects of the Indian tribes of the United States,' by the Rev. Frederick Baraga, Catholic Missionary at the Ance, Lake Superior, 1847," reprinted as *Chippewa Indians as recorded by Rev. Frederick Baraga in 1847* (New York-Washington: League of Slovenian Americans, 1976), 83.
14. Warren, *History of the Ojibway People*, 104-106.
15. Warren, *History of the Ojibway People*, 105-106. "Their great success on this occasion, they attribute not only to superior numbers, but to the great advantage which they possessed in the size of their canoes, compared with those of the Foxes. Theirs were made large and strong, sitting firmly on the water, made to withstand the storms of Lake Superior, and capable of holding from five to twenty men each, while on the other hand, the canoes of their enemies, though made of the same material (birch bark), were constructed frail and crank, made to be taken across long portages on a man's head, and

capable of containing but two or three persons. These, therefore, were easily upset, and their owners struggling in the deep water, were easily knocked on the head with war-clubs."

16. Danziger, *The Chippewas of Lake Superior*, 36.
17. Probably near the site of the modern village of Bayfield, Wisconsin.
18. Warren, *History of the Ojibway People*, 101-102.
19. Dakota tradition contains an account of a similar incident. It is unfortunately impossible to determine whether it took place during this period on Lake Superior or later on one of the rice lakes of Wisconsin: When most of the men of a certain [Dakota] village were about starting on a war expedition, one young man who did not seem inclined to go was sharply reproved by his father, who said to him, "I suppose you hope to have a good time with the women when the men are all gone." The son, stung by his father's reproaches, joined the war party; but the Ojibways were found securely posted on an inaccessible island, and the party were compelled to return without accomplishing anything. As they were about to turn back, the young man handed one of his garments to a comrade, saying, "Make my father sad with this;" then plunging into the lake, he swam to the island and was killed by the enemy. Samuel W. Pond, *The Dakota or Sioux in Minnesota As They Were in 1834*, first published in 1908 in *Minnesota Historical Collections*, volume 12, reprinted St. Paul: Minnesota Historical Society Press, 1986, 143. Regardless of time or place, this account is of some interest, since the operations of the Dakota against the Ojibwa are once again depicted as severely handicapped by their lack of canoes.
20. For Ojibwa weapons: Dunsmore, *Chippewa Customs*, 146-148, 169-170.
21. Warren, *History of the Ojibway People*, 101-104.
22. Pond, *The Dakota*, 64.
23. Pond, *The Dakota*, 41. Edmund J. Danziger, when speculating as to the reasons for the Ojibwa victories over the Dakota suggests that "Their light birch bark canoes...surpassed the enemy's awkward dugouts." *The Chippewas of Lake Superior* (Norman: University of Oklahoma Press, 1978), 37.
24. Had this not been the case, they would have omitted these battles from the oral tradition, and included whatever events were considered to be more important.
25. Francis Assikinack, "Legends and traditions of the Odahwah Indians," *The Canadian Journal of Industry, Science, and Art*, vol. 3, no. 14 (March, 1858), 119.
26. Native Americans were fully aware of the concept of control of a body of water. William Newbigging has discussed the importance of Lake Huron for the Ottawa (who were closely related to the Ojibwa), and their occupation of the "gateway" of Detroit to secure the resources of the lake in the early eighteenth century. William Newbigging, "The Ottawa Settlement at Detroit," paper read at the annual meeting of the Canadian Historical Association, Charlottetown, 1992, 23-28. During the American Revolution, John Deserontyon, a Mohawk chief, referred to the "control of the lake [Ontario]" that would result from a British naval presence. Deserontyon [Odeserundiye] to Claus, 9 March, 1779, National Archives of Canada, Manuscript Group 19, F1, Claus Papers, vol. 24, f. 1, microfilm, reel C-1485.
27. Richard Lortie, "La guerre des Renards, 1700-1740 ou quatre décennies de résistance à l'expansionnisme français," (M. A. thesis, Université Laval, 1988).
28. Tim Holzkamm, "Eastern Dakota Population Movements and the European Fur Trade: One More Time," *Plains Anthropologist*, vol. 28, no. 101 (August, 1983), 225-226.

The Francis B. Lothrop, Jr. 1995 Awards



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The Brig *Isabella*: A Hudson's Bay Company Shipwreck of 1830

JAMES P. DELGADO

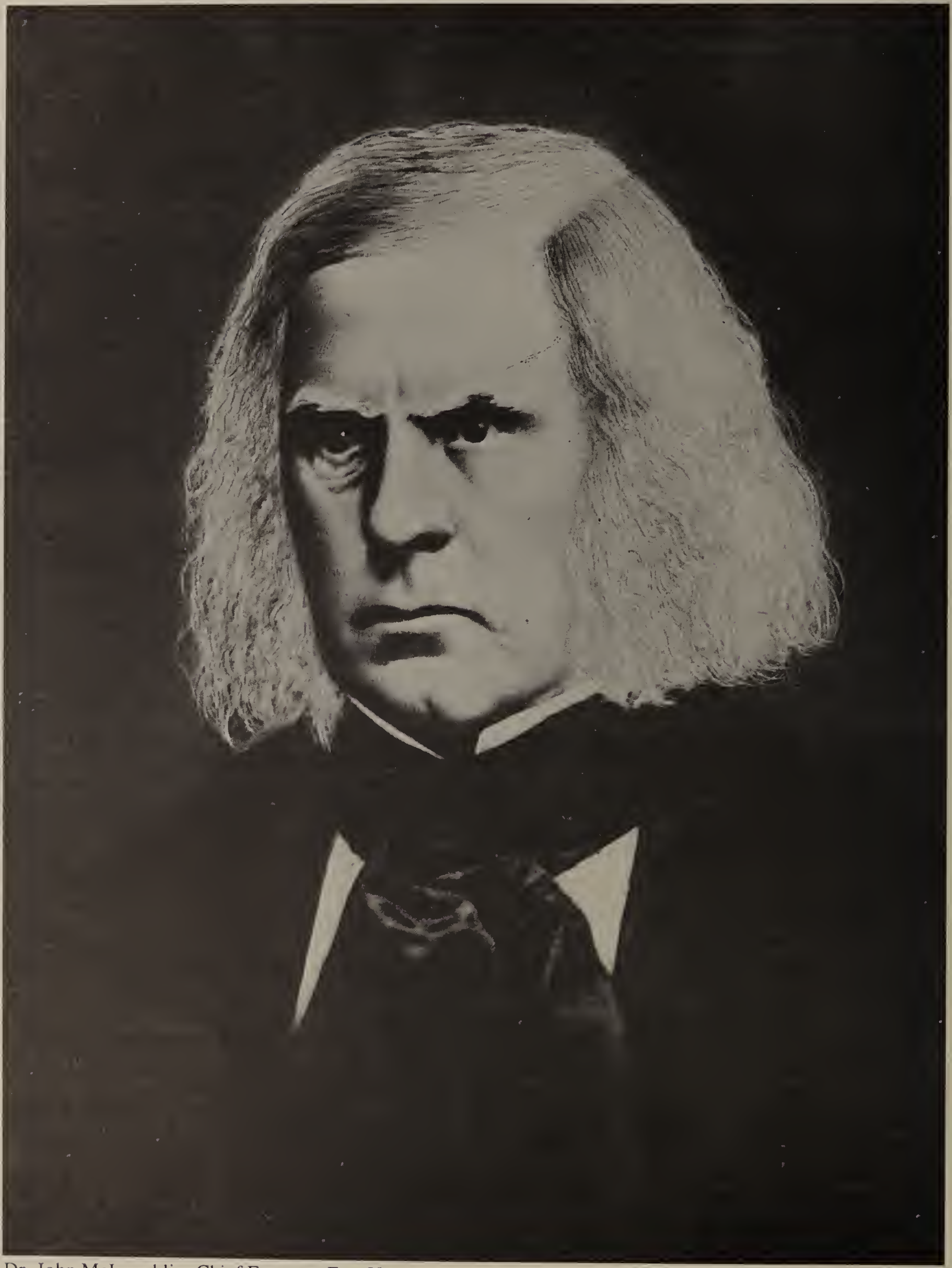
The potential for profits from the North American fur trade inspired the creation of one of the largest and most powerful business concerns on the continent, the Hudson's Bay Company. In its still thriving three-century career, the Hudson's Bay Company spanned North America. Chartered in 1670 by Charles II as the "Company of Adventurers of England trading into Hudson's Bay," it was granted authority to exploit the resources of a tremendous area on the continent, including the shores of Hudson Bay, the Arctic, and vast areas of what eventually would become Canada and the United States.

During the first decades of the nineteenth century, the Hudson's Bay Company began to seek Pacific outposts, moving west to tap the rich fur-bearing regions defined by the great rivers that drained the Pacific basin. The maritime fur trade along the Pacific coast was a powerful incentive to expand to the western shore, but others had already arrived and stood in the way of the Company. John Jacob Astor's American firm, the Pacific Fur Company, and the North West Company of Montreal had pioneered the fur trade of the far west. British interests bought out Astor during the War of 1812, leaving the North West Company as the Hudson's Bay Company's greatest obstacle to Pacific trade. A merger of the two companies in 1821, enforced by the British government to halt physically violent confrontation between the two concerns, brought to the Hudson's Bay Company all of the North West Company's posts.

Fort George, the former American fort at Astoria at the mouth of the Columbia River, served as interim headquarters for the Hudson's Bay Company's new Department of the Columbia until 1825, when a new post was established farther up river at Fort Vancouver. The fort was the principal Pacific entrepot of the fur trade from the 1820s through the 1840s. Traders and trappers from inland posts came down river, bringing bales of pelts to exchange for supplies and trade goods. From Fort Vancouver, all of the company's furs from the American and Canadian coast were shipped to England. The ships that sailed to England with the furs were sent back each year with the trade goods for the coast that Fort Vancouver then distributed on its coasting vessels to outlying trading posts and forts.

The Hudson's Bay Company employed a fleet of some eighteen vessels during the thirty-year heyday of the Columbia Department. The first was the six-year-old, Bermuda-built, 161-ton brig *William and Ann*, purchased by the Company in May 1824 and sent to the coast in July of the same year. The company decided to purchase and send their own ship after "finding that the freight asked for vessels on charter to the Columbia rather high...."[1]

William and Ann arrived at the mouth of the Columbia River in April 1825, remaining on the coast for several months before returning to London in October. The brig was sent north to seek sites for coastal trading outposts, all part of Hudson's Bay Company policy to compete directly with the large numbers of American traders working off various vessels on the coast. While the effort was at first hampered by a lack of men and supplies, *William and Ann* made a



Dr. John McLoughlin, Chief Factor at Fort Vancouver and officer in charge of the Columbia Department of the Hudson's Bay Company. Vancouver Maritime Museum.

return voyage to the coast in 1826–1827, and in 1826, workers at Fort Vancouver began the construction of a small sloop, *Vancouver*, for the coastal trade. The sloop remained incomplete for several years, not making a voyage until 1831.

The arrival of the schooner *Cadboro* in 1827 provided another vessel for the coastal trade, and through chartering other vessels, the Hudson's Bay Company was gradually able to augment its fleet. The coastal trading effort, as well as the annual supplying of the Department of the Columbia, was dealt a serious blow, however, when *William and Ann* was wrecked at the mouth of the Columbia River on March 10, 1829, with the loss of the entire crew and the majority of the cargo. George Simpson, governor of the Northern Department of the Hudson's Bay Company, wrote to the company's offices in London that "the melancholy fate of the *William & Ann* deranges all our plans in regard to the business of the coast for this year...."[2] To offset the loss, the Hudson's Bay Company decided to replace *William and Ann* quickly. The schooner *Cadboro* and the chartered vessel *Dryad* were insufficient, and so the Hudson's Bay Company bought the brig *Isabella*. Small yet capacious and strongly built, the brig was typical of the Company's fleet that served on the Pacific Coast between 1830 and 1850.

Isabella was built at Shoreham, Sussex, on the channel coast of England, in 1825.[3] In all respects, *Isabella* was an ordinary vessel, one of hundreds of British brigs built in the early nineteenth century as carriers of bulk cargoes such as coal and grain. *Isabella* was registered at 194 62/94 tons, with an estimated length of 84 feet, 4 inches, an extreme breadth of 22 feet, 9½ inches, and a depth of hold of 15 feet, 2 inches. The brig's draught, fully loaded, was 13 feet. *Isabella* likely carried a raised quarter deck with an aft cabin below it.[4] *Isabella*'s first listing in *Lloyds' Register of Shipping* in 1825 lists her as a copper sheathed brig with a single deck, with beams in the hold.[5]

Isabella's first owner was a Mr. Elmore, who employed Capt. R. Cowle (or Cowell) as master. Cowell worked the brig in the trade between London and Cádiz. Elmore sold *Isabella* to Messrs. Gilmore and Richardson of London in 1828.[6] The new owners re-rigged *Isabella* as a snow and placed her under the command of Capt. Cowell for trade between London and Gibraltar.[7] In 1829, *Isabella* was offered for sale by Gilmore and Richardson. On September 9, 1829, Hudson's Bay Company officer William Smith wrote to his agent in London that "The Governor has instructed me to direct you to move the brig *Isabella* to Messrs. Wigrams' yard as quickly as possible she is to be docked without delay and her copper stripped off, if in such a state as to require it, the state of her bottom can then be ascertained, and Mr. P [John Henry Pelly, Governor of the Hudson's Bay Company] will see her, and give instructions as to what will have to be done to her." The agent was also instructed to inventory the brig's sails and rigging.[8]

The survey of the ship, done at the Blackwall shipyard of Messrs. Green, Wigrams and Green, was satisfactory, and the Hudson's Bay Company purchased *Isabella* on October 10 for £2,900.[9] *Isabella* was re-coppered over boards and inspected by Lloyds in October before being cleared to sail. The brig sailed from the London Docks on October 29, 1829, to Blackwall, from where she sailed on October 30 for Gravesend, Cowes Road, and St. Helen's Road before departing on November 13 to cross the Atlantic.[10] *Isabella*'s cargo was varied and reflected the needs of Fort Vancouver's growing agricultural and industrial community with tools, medicines, stationery supplies, preserved foods, lead and pig iron, and paint, as well as the commodities of the fur trade — guns, ammunition, blankets, beads, copper cooking pots, candles, mirrors, tinware, buttons, combs, tobacco, and tea.[11] *Isabella* was also fitted with armament — six 9-pounder carronades — for the coastal trade's isolated and sometimes hostile shores.

In a letter dispatched to Chief Factor John McLoughlin at Fort Vancouver, the brig's destination, the Governor and Committee of the Hudson's Bay Company reported that "*Isabella*

The Blackwall Yard on the Thames where *Isabella* was surveyed and fitted out for her voyage to "the Northwest Coast of America." Painting by William Daniell, National Maritime Museum, Greenwich.

is commanded by Capt. [William] Ryan and has two Mates and twelve men all engaged for three years as per contracts and for general service."[12] In addition to Capt. Ryan, *Isabella* shipped first mate William Eales, second mate James Scarborough, carpenter Edward Dennison, steward Archibald Campbell, cook William Wilson, surgeon John Kennedy, ship's boy Thomas Clarke, and eight seamen: Robert Allen, Angus McLeod, James Johnston, William Jones, James Sterling, John Flinn, Thomas Wood, and William McLeod.[13]

Isabella sailed with a great deal of work to fit out the ship for the fur trade not yet done. During the first two weeks out, as the brig worked through rough seas, shipping much water on the deck, and with *Isabella* described in the log as "labouring," the bilges were constantly pumped by the crew. The carpenter worked hard battening hatches, installing a booby hatch at forecastle, and a fore scuttle hatch. During the end of December, carpenter Edward Dennison was busy repairing the head knees, caulking waterways, "putting planks in the ship in midships...fitting new coamings around the foremast & caulking the forecastle deck," and replacing the bowsprit and bobstay shrouds. In the South Atlantic in early January, the carpenter was busy repairing the half deck hatch and lengthening the rails on the main deck.[14]

On January 24, the brig's crew sighted Staten Island; three days later, Cape Horn was passed, bearing west northwest about fifty miles. Heavy seas "washed away part of the lee bulwark" on February 1, and the stern davit was damaged on February 11. Dennison, employed constantly since sailing, finally had enough, though, and the next day the log noted "carpenter made a prisoner for insolence and swearing in a blackguard manner." Dennison refused to return to duty as *Isabella* sailed north. The brig arrived in the Hawaiian Islands on March 23, 1829, where Captain Ryan "shipped 10 Kanakars at Woahoo." On March 25, Carpenter Dennison returned to duty, and on March 27 was once again at work repairing *Isabella*, "caulking & driving some new treenails in the larb'd bow" as the crew provisioned the brig for the final leg of the voyage. On March 31, the ship was painted "inside & out," and on April 7, *Isabella* sailed from Oahu for the Columbia River.[15]

At 2:30 a.m. on May 2, the coast was sighted, and at 4:30 Ryan shortened sail to single reef topsails. By noon, Cape Disappointment bore northeast by east, and throughout the day and into the evening, *Isabella* approached the Columbia River Bar. Captain Ryan made a critical mistake as he entered, thinking that Chinook Point was Cape Disappointment. Bearing too far to the south, he missed the channel. At 4:00 a.m. on May 3, *Isabella* crossed the bar, which was marked by "a very great swell & broken water ahead...."[16] Outside of the channel, the brig struck. The rudder tore free and *Isabella* broached to with her head to the north, "unmanageable in the heavy sea and strong flood tide."[17] A broken piece of rudder remained attached to the sternpost; with this fragment and by trimming sails, Ryan and the crew tried to work the brig out of danger.

Pounding on the sand bottom in fifteen feet of water, *Isabella* was in peril. The larboard bower anchor was let go, and the crew "got the boats out, stove the water casks upon deck and cleared away the lumber. Vessel still striking very heavy we hove a great deal of the cargo and stores overboard to lighten her."[18] "Having hove overboard, about thirty tons of stores and cargo and the vessel still continuing to strike hard, there appeared little prospect of saving her and being surrounded with heavy breakers fearing she would drive on shore into them when it would be impossible to save ourselves," Ryan ordered *Isabella* abandoned at half past eight P.M.[19] The crew took to the brig's boats, impelled not only by the possibility of shipwreck, but also by tales that *William and Ann*'s crew had been massacred by the Clatsop people after that brig's loss.

Captain Ryan later reported that "being strangers in this uncivilized country, and having heard such evil reports of the savage character of its inhabitants and that they had last year murdered the crew of the *William and Ann*, we were afraid to land anywhere lest we would be attacked and murdered by the natives, we therefore kept in our boats (which were armed) and proceeded up to Fort Vancouver," arriving there on the evening of May 4.[20] Unknown to Ryan, a group of Hudson's Bay employees at Fort George saw him coming in and raced to his assistance, reaching Clatsop Spit after nightfall. The wind was blowing strong, so a canoe could not be launched to reach *Isabella*. The Hudson's Bay Company party ashore lit a fire at Clatsop Spit and at Sand Island; "Capt. Ryan saw the fires but did not go to them as he was afraid," John McLoughlin later reported.[21]

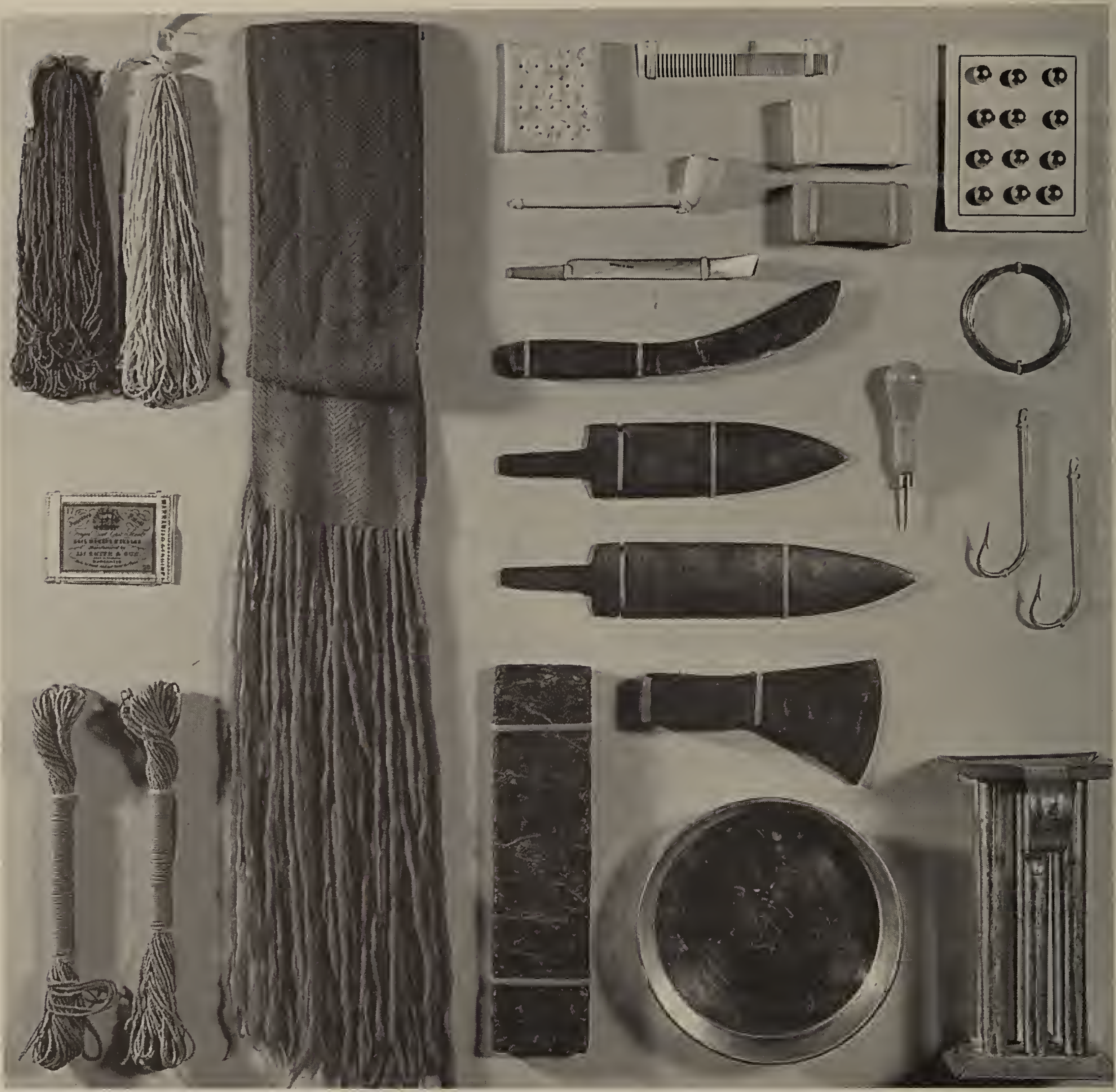
Ryan had too hastily abandoned his vessel. The Hudson's Bay Company crew at the site visited the brig on the morning of May 4, then sent a note to Fort Vancouver, where a distressed and disgusted Chief Factor McLoughlin had just received the captain and crew of *Isabella*. McLoughlin reported to his superiors that "when Capt. Ryan arrived here he could not distinctly ascertain where he had left his vessel....it was only when I received Mr. Mansons I actually learnt where she was and if Capt. Ryan had remained on board with his crew it is certain the vessel would have been saved as on the turn of the tide they had only to slip her cable and she would have drifted into smooth water."[22]

McLoughlin immediately sent Ryan and *Isabella*'s crew back to the wreck with a party from the fort to see if the brig could be salvaged. McLoughlin, writing to Capt. Aemilius Simpson of the Hudson's Bay Company, noted that Ryan and his crew "can do but little, but still they are better employed in collecting the materials they can from the wreck (to prevent the Indians getting them) than they can be here...."[23]

They arrived at the wreck on May 6, where Ryan noted "she had parted from her anchor and was drifted upon a shoal where at low-water she was left dry and a considerable distance beyond her." The anchor cable had parted on the evening of May 3 during a storm. The hold was flooded with six feet of water; six hours' work pumping lowered the level to two feet. The masts and yards were struck "to ease her and as much cargo and stores as possible removed to lighten her and carried to a sandy island about three quarters of a mile distant from the vessel," where Ryan and his crew pitched camp.[24]

The camp was established "so as to prevent the natives from plundering the property and to take advantage of the ebb tides to proceed on with the lightening of the vessel and saving the cargo as from half flood to half ebb it was not possible to approach or remain by the vessel in consequence of the heavy surf which broke all round and over" *Isabella*.[25]

Work continued to free the ship. A hole was cut into the port side of the wreck on the May 9



Hudson's Bay Company trade goods of the type that made up *Isabella*'s cargo. Shown here are beads, a sash, twine, knives, fish hooks, tinware, tobacco, brass hawk bells, copper wire, axes, hardtack, clay pipes, horn combs, and soap. Vancouver Maritime Museum.

to allow a pump log to be set up to further lower the water in the hold, and a fair portion of the cargo was removed from the wet, dark confines of the half-sunken hulk. Working with the local Clatsop Indians, the crew dried the cargo on the sandy island before taking it across the river by canoe to Fort George. Once the hull was stripped of all items that could be reached, work proceeded on trying to save *Isabella*.

It was soon obvious, despite all rescue efforts, that the wreck was bedding down in the sand and breaking apart. On May 24, McLoughlin sent Aemilius Simpson, captain of the company vessel *Cadboro*, First Mate William Eales, and James Anderson and John Apena from Fort Vancouver's small shipyard aboard *Isabella* to survey the ship and see if "any means yet remained to float her off the sands into deep water and convey her to any part of the river where she might be repaired." The surveyors found "her main beams started, Her knees broke, her upper decks blown up and a great part of them washed away, her water ways much strained bulwarks washed away, the ceiling all along the starboard bilge started the sheathing and copper torn off both bilges and every appearance that all her starboard bilge was stove in, her companion and hatches washed away and the butt ends started all along her bends."[26]

The ship had worked into a bed of sand some twelve feet deep, which had flooded. Some thought was given to trying to float the brig off the sand, but even at high tide there was not enough water around the ship to move her. "In smooth water this might be accomplished with empty casks, but as a heavy break always made round her with the flood they would be dashed to pieces. A spar deck could it be laid might float her off, but the surf making a clear breach over her with every flood would destroy the labour of carpenters during the ebb, and thus render it an endless operation." The surveyors recommended abandoning the brig. Attempts to save *Isabella* "would be an unnecessary sacrifice of labour...as we consider her a total wreck."[27]

McLoughlin, who arrived at the wreck site on May 7, supervised the recovery of undamaged cargo valued at £8,219.11.11 "at invoice price" and damaged cargo which he estimated was worth £92.2.2, "besides ships stores & rigging."[28] McLoughlin duly reported the loss and the efforts to save what they could from the wreck to the Governor and Committee of the Hudson's Bay Company in October 1830, adding in a separate report in March 1831 that the disaster was "neither owing to stress of weather or to any difficulty in entering the Columbia but merely to Capt. Ryan's making a mistake and taking a wrong channel."[29]

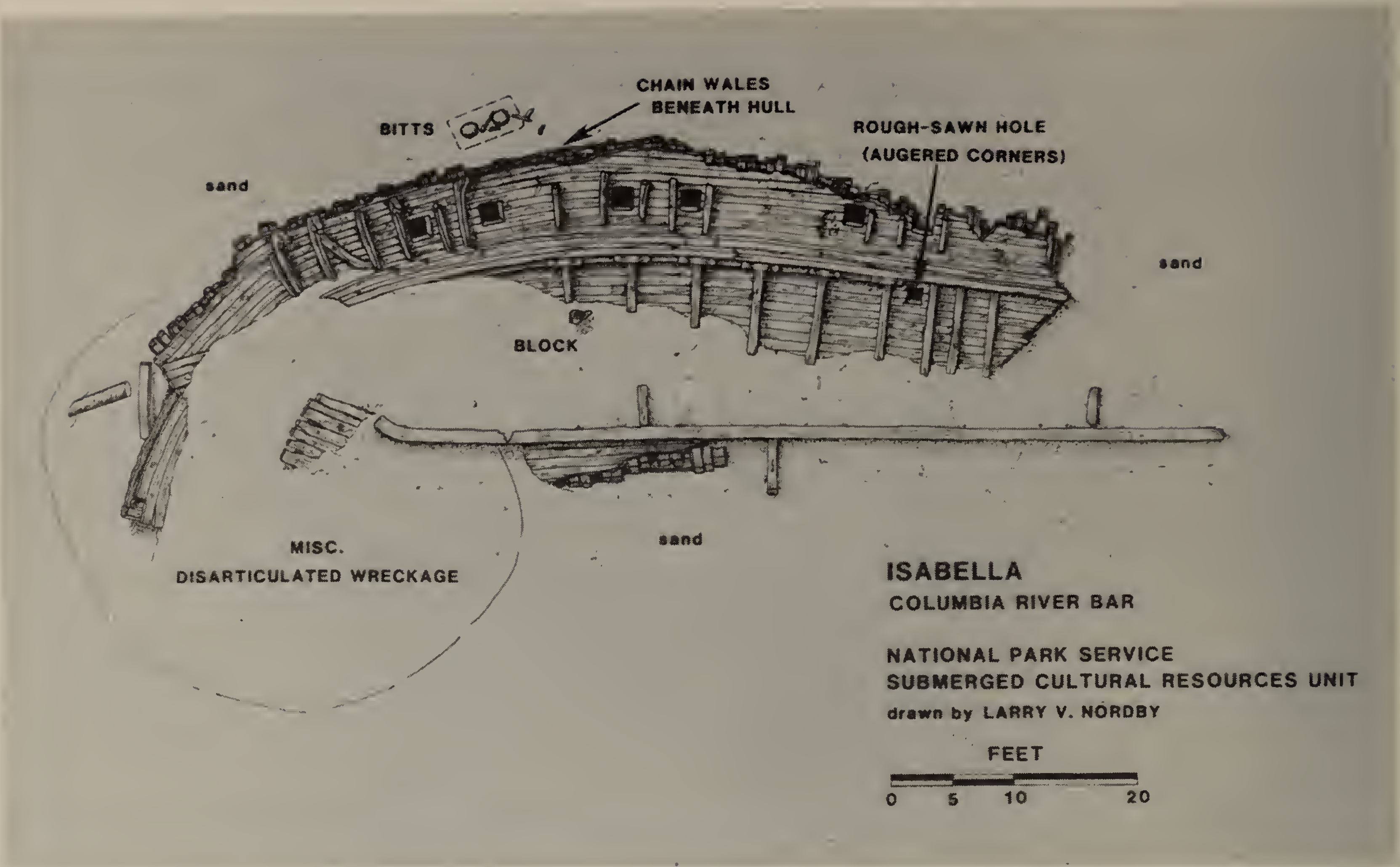
The Company wrote McLoughlin in September 1831, noting "the loss of the brig *Isabella* is on many accounts to be regretted, we trust however that it will not prove of any serious consequence to the coasting trade, as various stores saved from the wreck have no doubt enabled you to equip the vessels built at Fort Vancouver in a proper state for sea. We herewith transmit a statement of the accounts as settled with the underwriters, by which you will notice, that there has been recovered 75 p. ct. on the ship and £27.6d. on the cargo."[30]

The sloop *Vancouver*, built at the Fort in 1826, had languished for lack of fittings until the wreck of *Isabella*. Using items salvaged from the brig, Fort Vancouver's shipyard outfitted *Vancouver* for the coast. Captain Ryan and his crew were ordered to take the sloop on her maiden voyage. *Vancouver* remained active in the coastal fur trade until she, too, was wrecked, in 1834. Ryan was no longer in command by then. In 1831, he was sent back to England as master of the company's *Ganymede*. For his loss of *Isabella*, Ryan was demoted to first mate of *Ganymede* for the trip home.

George Simpson, writing his opinion of *Isabella*'s master in 1832, felt that Ryan "does not appear to be a man of much talent in his profession — his private character I believe is tolerably good." Ryan returned to the coast in *Ganymede* in 1832 and remained in the company's service for the next few years. Ryan redeemed his reputation. His former critic, John McLoughlin, wrote in 1835 that Ryan was a "good sailor, a sober man, and careful of the vessel and property entrusted to his charge." Ryan was promoted to master of *Cadboro* and returned to England as master of *Dryad* in 1836. He then retired from the Hudson's Bay Company.[31]

The remains of *Isabella* lay undisturbed from 1830 until September 23, 1986, when Daryl Hughes, a Chinook, Washington commercial fisherman, snagged his nets on the wreck near Sand Island. The island, near Ilwaco, Washington, lies in Oregon waters close to the mouth of the Columbia River. While the identity of the wreck was not known, it was marked on the 1890, 1895, 1915, and 1921 charts of the river's mouth. A buoy numbered S–11, shown on the 1921 chart just east of the wreck symbol, is probably the source of large buoy sinkers found next to the wreck in 1987.

Mr. Hughes was not the first to snag a net at the spot but was the first to send a diver down.

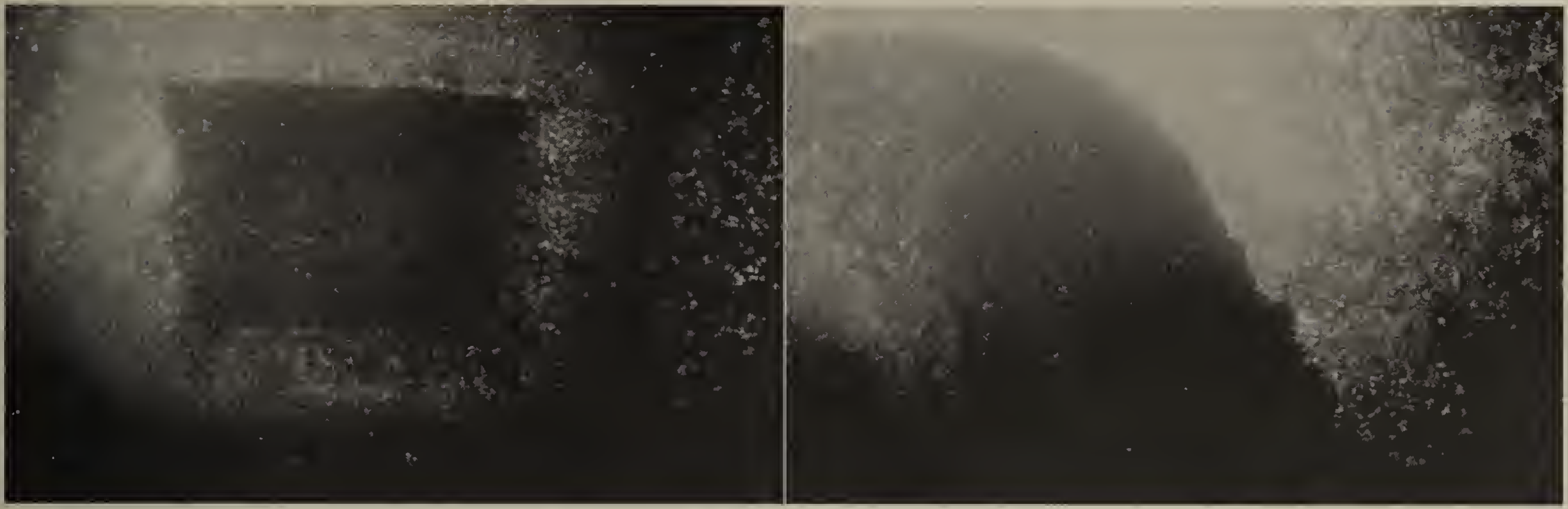


Map of the exposed remains of *Isabella*, 1987. National Park Service drawing by Larry Nordby, Submerged Cultural Resources Unit.

The diver reported that Hughes' gillnet had caught on the exposed remains of a wooden vessel. Hughes, knowledgeable about the river's history, reported his discovery to Larry Gilmore, the curator of the Columbia River Maritime Museum. Hughes "stated his belief" that the wreck might be *Isabella*, according to Gilmore; while initially skeptical, he became increasingly convinced that Hughes had rediscovered the lost Hudson's Bay Company brig. Gilmore's research showed that while four wooden vessels had been lost near Sand Island, the size of the vessel discovered by Hughes closely corresponded with *Isabella.*

Gilmore enlisted the support of the Museum, Oregon State University Professor David Brauner, and Lieutenant Commander Michael Montieth, the officer commanding the U.S. Coast Guard station at Cape Disappointment. Armed with a permit from the Oregon State Archaeologist, Gilmore organized a series of dives on the wreck by Montieth, who was joined by wreck diver James Seeley White and several other divers. These individuals, working in the limited visibility and fast current of the river bottom, made more than forty dives on the wreck. Montieth, who had previous experience in archaeological diving, made a preliminary sketch of the wreck. Gilmore was also successful in obtaining assistance from the National Park Service. As the nation's principal conservation agency, the NPS manages a series of programs aimed at preserving and interpreting American heritage both in and outside the National Park System. The NPS, as part of these responsibilities, also hosts the federal government's only working field team of underwater archaeologists, the Submerged Cultural Resources Unit.

In August 1987, a Submerged Cultural Resources Unit team led by unit chief Daniel J. Lenihan and consisting of archaeologist Larry V. Nordby and the Maritime Historian for the National Park Service, James Delgado, traveled to Ilwaco to begin a series of dives on the wreck site with Lieutenant Commander Montieth, White, and other local divers. The NPS team



Left: The hand-cut hole in the starboard side that identified the wreck as *Isabella*. Visibility is poor in the dark, murky waters at the mouth of the Columbia River. Right: Knees line the interior of *Isabella*'s hull. National Park Service photograph by Daniel Lenihan, 1987.

also included Pacific Northwest Regional Archaeologist Jim Thompson. Working for a week, the team was able to produce a detailed map of the wreck and confirm its identity as *Isabella*.

The remains of *Isabella* lie on a hard sand bottom in thirty-eight feet of water. The prominent feature of the wreck site is the exposed, substantially intact starboard side of the vessel, which rests at an angle, with the hull resting on the slope of the bottom. The hull split open at the bilges, leaving a row of exposed frame or floor ends. The keelson lies partially exposed in forty feet of water, and to its left, and in the river channel, the largely buried port side rests in the sand. Exposed beams, planking and the knees that supported the deck rise from the sand to mark the location of the port side.

The exposed starboard side is intact from the bilge to the waterway, or the original deck level. The hanging knees, lodging knees, and the stumps of the deck beams indicate where the now vanished deck was located. The bulwark, or railing, is gone, but several broken stanchions mark its location. Three horizontal timbers run along the interior of the starboard hull; a hold-beam shelf for the main deck, a bilge keelson, and a shelf piece and clamp for the tween deck. The broken deck beams for the tween deck are not supported by knees. They rest on riders, or beams, bolted atop the planking that run from the bilge up to the shelf and clamp. This type of construction was noted in the Lloyds' registry for *Isabella*, which noted "beams in hold."

The starboard hull is also lined by a series of six cargo or ballast ports below the sheerstrake. These ports, closed and caulked during voyages, were opened to salvage the cargo when the brig wrecked. Another indication of the salvage is found on the underside of the starboard hull. Resting against the bottom on what was once the outer hull are the remains of the chain wale and chain-plates for *Isabella*'s two masts. The wooden chain wales project out some two feet from the hull. The ends of the wales are missing, and only the stubs of the iron chain-plates remain. The marks from a crude cutting of the chain-plates shows that they were salvaged from the wreck, just as the historical record also indicates.

Below the cargo ports, on the starboard side, a small square hole was cut into the hull. Originally thought to be another cargo port, it was carefully examined in 1987. Augur holes in the four corners of the hole, which was cut out with a saw, the partial cutting away of the frames beneath, the crude hacking of the outer hull planks indicated that the hole was cut after the brig ran aground, as it was close to the waterline and could not have been done if *Isabella* were afloat. The brig's log entry for May 9, six days after the wreck, noted that the carpenter "cut a hole in the side to let the water out, so that we could better get at the cargo." The hole was one of the conclusive pieces of evidence in identifying the wreck as *Isabella.*

The open cargo ports, the removal of the brig's standing, or permanent rigging, and the hole cut in the side of the hull conform to the historic accounts of the loss of *Isabella.* They also show that when lost, the brig lay broadside on the spit, heeled offshore on its port side, on the beam ends, decks exposed to the waves, and the starboard side of the wreck in the lee. Cutting the hole drained water sufficiently to allow the crew and their Clatsop helpers to clamber inside the wet, dark hold to retrieve *Isabella*'s cargo. They were apparently thorough, for the archaeological survey of 1987 disclosed no loose artifacts save a single sheave block from the rigging that now lies inside the wreck.

In June 1994, a new survey was made of the wreck by LCDR Montieth, his son Michael, LT Larry Kennedy, USCG, and Jerry L. Ostermiller, Executive Director of the Columbia River Maritime Museum. Additional scouring of the wreck since 1987 has exposed an additional 25–30% of the hull, noticeably along the port side, and has undercut the starboard hull. Ostermiller noted that the stern of the ship is missing, with a line of broken hull planking running aft "showing this separation dramatically."[32] Scattered wreckage to the east of the hull may represent the stern, as well as decking, but these areas were not surveyed in 1987 or 1994, and additional work is needed. The 1994 survey did note several exposed concretions, indicating the presence of metal artifacts inside the hull, as well as off the port side.

The wreck of *Isabella* was nominated to the National Register of Historic Places on December 1, 1987. After an exhaustive review, the wreck was listed on the National Register on September 21, 1989. *Isabella* is now one of fewer than two hundred shipwrecks listed in the National Register, and one of only a handful listed on the Pacific Coast. That unique distinction is due to the fact that the brig's seemingly brief role in the history of the fur trade and its short career in the Hudson's Bay Company left a unique and significant tangible entity from a now vanished and yet important aspect of international, Pacific Coast, Oregon, and Columbia River maritime history.

* * *

James P. Delgado is the Executive Director of the Vancouver Maritime Museum in Vancouver, British Columbia. He previously served as the Maritime Historian of the National Park Service in Washington, DC. Trained as a maritime archaeologist and historian, he has participated in many shipwreck archaeological projects, and in 1987 joined the NPS team that identified and documented the remains of Isabella.

Credits

I am indebted to the staff of the Hudson's Bay Company Archives at the Provincial Archives of Manitoba, Winnipeg, for access to the Company's records on Isabella. *The staff at Fort Vancouver National Historic Site, principally Curator David Hansen, provided sources, as did the Fort Vancouver Regional Library in Vancouver, Washington. Contributions of Larry D. Gilmore, formerly Curator of the Columbia River Maritime Museum were the starting point for this research. Additional information and reassessment of the wreck in 1994 was made possible by Jerry L. Ostermiller, Executive Director of the Columbia River Maritime Museum. Ostermiller's research also discovered* Isabella*'s presence on charts of the Columbia's mouth.*

Diving on the wreck of Isabella *in 1987 was made possible through efforts of Cape Disappoint-*

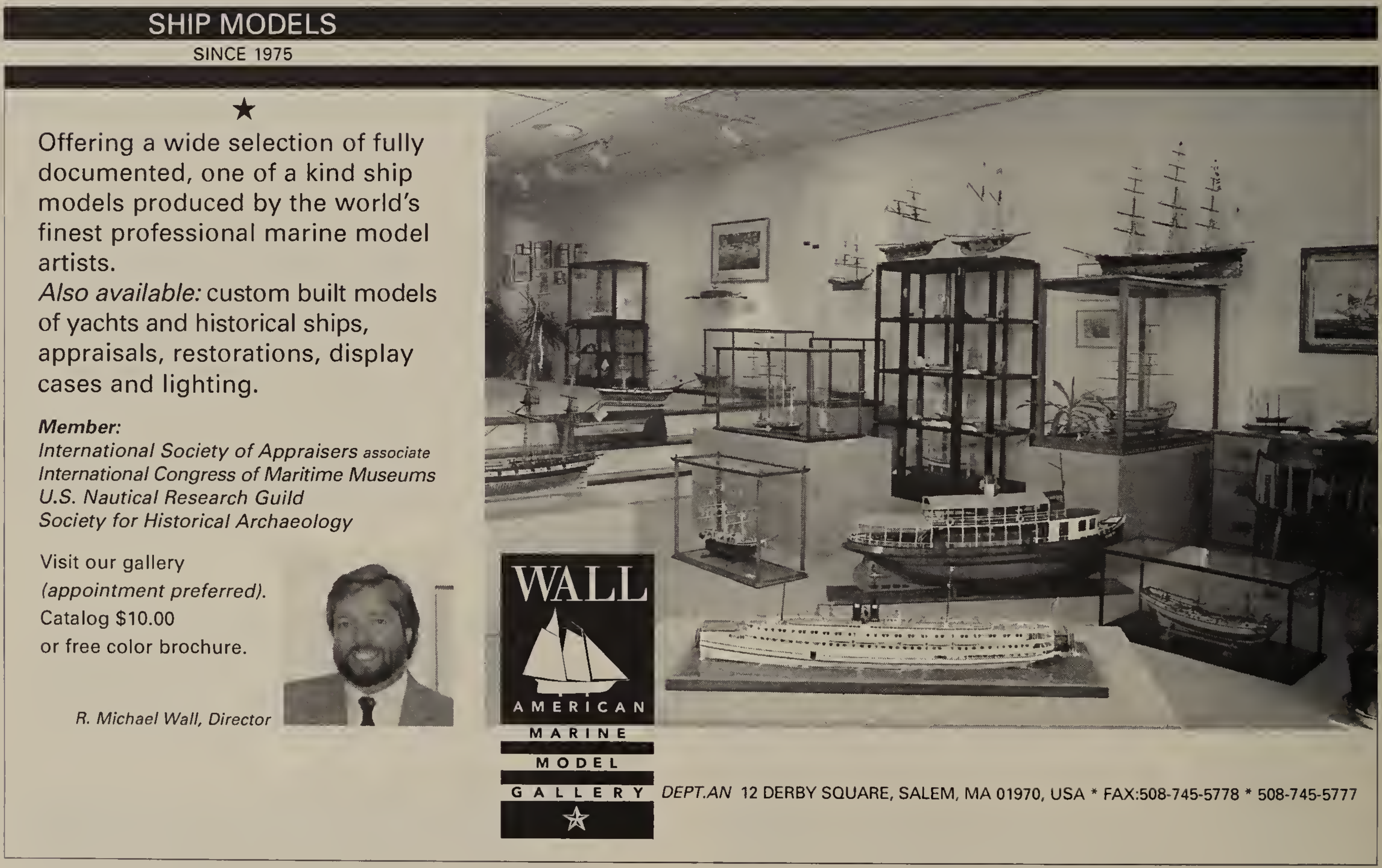
ment Coast Guard Station, LCDR Michael Montieth, USCG, commanding officer of the station, the Columbia River Maritime Museum, the Pacific Northwest Regional Office of the National Park Service, and the Submerged Cultural Resources Unit of the N.P.S. I am grateful to Unit Chief Daniel J. Lenihan for including me on the team, and to Larry V. Nordby for his incisive, thoughtful contributions to the research design and archaeological and anthropological understanding of the wreck. Graphic documentation of the wreck was undertaken by Larry Nordby, with the assistance of the team and with a Sonic High Accuracy Resolution Plotting System (SHARPS) operated by Frank Geisel of Marine Telepresence, Inc. of Woods Hole, MA.

Notes

1. Letter, Governor and Committee of the Hudson's Bay Company to George Simpson, London, June 2, 1824. Hudson's Bay Company Archives, A. 6/20, f.161.
2. Letter, George Simpson to the Governor and Committee of the Hudson's Bay Company, Fort Vancouver, March 24, 1829, Hudson's Bay Company Archives, D.4/93, f.71d–72.
3. *Lloyds' Register of Shipping*. (London: Lloyds', 1825).
4. Richard E. Wells, reconstruction plans for *Isabella*, Sooke, British Columbia. The dimensions and plans are based on *Isabella*'s published tonnage and on a comparison with similar vessels of the period.
5. *Lloyds' Register* (London: Lloyds', 1825).
6. *Lloyds' Register of Shipping* (London: Lloyds', 1826).
7. *Lloyds' Register of Shipping* (London: Lloyds', 1828).
8. Letter, William Smith to Mr. Richard Gibbs, Surveyor, London, September 9, 1829, Hudson's Bay Company Archives, A.5/9, 64.
9. Minutes of the meeting of the Governor and Committee of the Hudson's Bay Company, October 21, 1829, Hudson's Bay Company Archives, A.1/56, 188.
10. Logbook, *Isabella*, Hudson's Bay Company Archives, C.1/355. Hereafter cited as Logbook, *Isabella*.
11. "Invoice of the Merchandise shipped on board the *Isabella*, Wm. Ryan for the Columbia River, consigned to John McLoughlin, Chief Factor, for the trade of Natives & the coasting trade....." London, 28 October 1829, Hudson's Bay Company Archives, A.24/39, Invoice Books, 1829–31.
12. Letter, Governor and Committee of the Hudson's Bay Company to John McLoughlin, London, October 28, 1829, Hudson's Bay Company Archives, A.6/22, f.45d–46.
13. "List of the Crews of *Isabella* and *Dryad*," Hudson's Bay Company Archives, B.223/z/4, fos. 170a–170b.
14. Logbook, *Isabella*, various entries from October–December, 1829.
15. Ibid., with entry dates noted in the main body of the text.
16. Ibid., entry for May 3, 1830.
17. Ibid.
18. Ibid.
19. William Ryan, "Public Instrument of Protest and Declaration....." in regard to the loss of *Isabella*, Sand Island, May 7, 1830, Hudson's Bay Company Archives, C.7/69, "*Isabella* Miscellaneous Papers." Hereafter cited as "Protest."
20. Ibid.
21. Letter, John McLoughlin to Governor and Committee of the Hudson's Bay Company, Fort Vancouver, October 11, 1830, as cited in Burt Brown Barker, ed. *Letters of Dr. John McLoughlin, Written at Fort Vancouver, 1829–1832*. (Portland: Binfords & Mort, 1948), 134–137.
22. Ibid.
23. Letter, John McLoughlin to Capt. Aemilius Simpson, Fort Vancouver, May 28, 1830, as cited in Barker, 104.
24. "Protest."
25. "Protest."
26. Aemilius Simpson, William Eales, James Anderson, and John Apena, Survey of the Wreck of *Isabella*, Sand Island, May 24, 1830, Hudson's Bay Company Archives, C.7/69, "*Isabella* Miscellaneous Papers."
27. Ibid.
28. Letter, John McLoughlin to the Governor and Committee of the Hudson's Bay Company, Fort Vancouver, October 11, 1830. Hudson's Bay Company Archives, B/223/b/6, fos. 13–18d.
29. Letter, John McLoughlin to George Simpson, Fort Vancouver, March 16, 1831, Hudson's Bay Company Archives, D.1/125, f.37–39.
30. Letter, Governor and Committee to John McLoughlin, September 21, 1831, Hudson's Bay Company

Archives, A6/22, fo. 107.

31. First mate William Eales and second mate James Scarborough remained in the Company's service, Eales serving as master of *Ganymede* in 1836–37 before he retired in 1850. Scarborough remained on the coast until 1850 in various vessels, serving as master of both *Cadboro* and *Mary Dare*, another Company ship. *Isabella*'s surgeon, John Kennedy, served the Company ashore, first as surgeon at Fort Vancouver before being transferred to Fort Simpson on the British Columbia coast. Kennedy was promoted to Chief Trader in 1847, and retired in 1856. Contentious carpenter Dennison, however, was sent home by 1831, his violent temper and surly nature too much for Company officials and his fellow sailors.
32. Jerry L. Ostermiller, "Reconnaissance Survey Report, Shipwreck Isabella, 29 June, 1994," typescript, Columbia River Maritime Museum, Astoria, Oregon.



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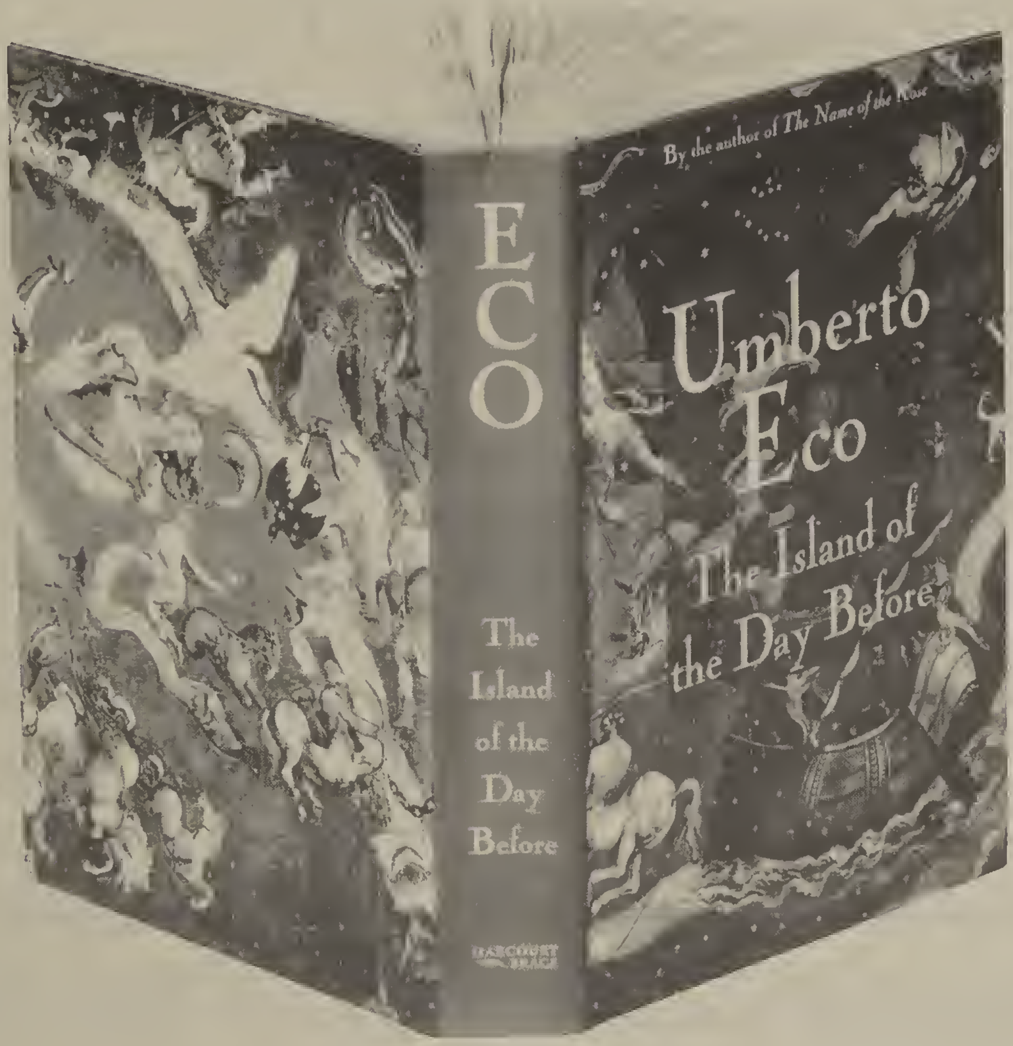
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The Island of the Day Before

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The Island of the Day Before

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Downbound
The History of the Early Great Lakes Propeller *Indiana*

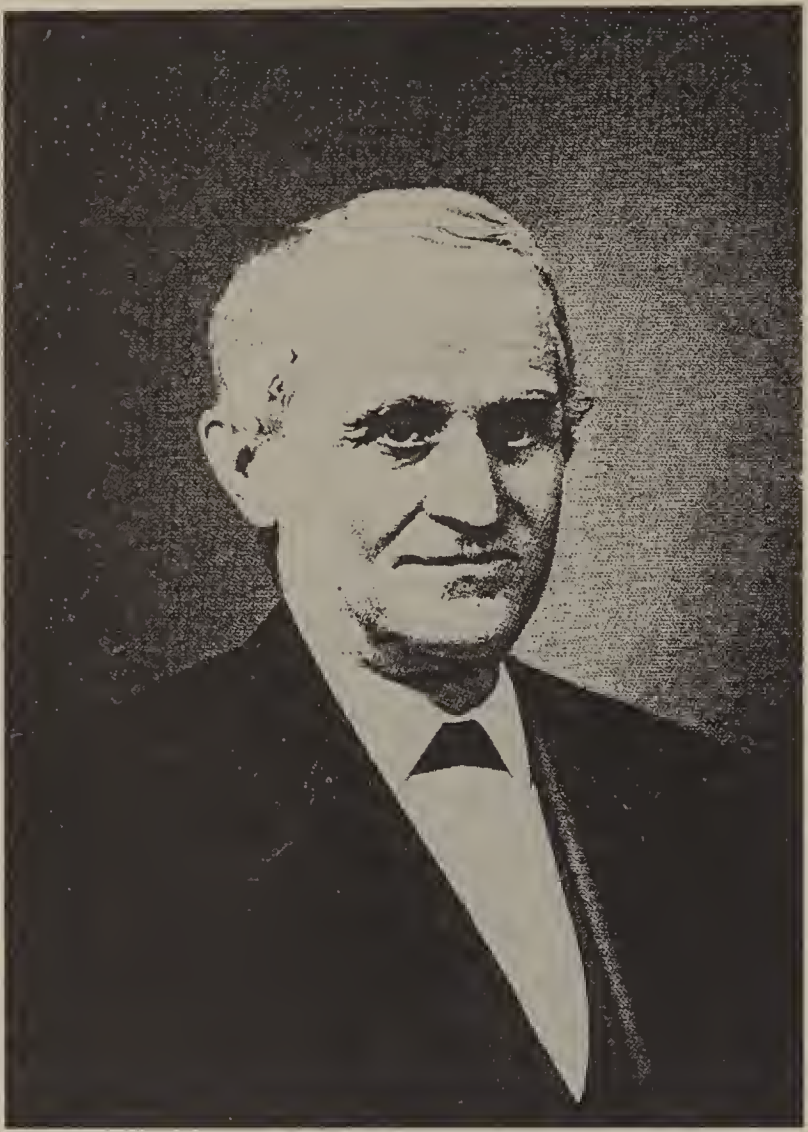
PAUL FORSYTHE JOHNSTON

Built in early 1848 a few miles to the west of Cleveland at the little town of Vermilion, Ohio, the propeller *Indiana* was utterly undistinguished throughout her ten-year career. This speaks to both her significance as well as her greatest liability, for although she was common to her day and place and therefore significant in our modern understanding of mid-nineteenth century Great Lakes settlement, development, and transportation, her lack of contemporary interest resulted in considerable gaps in the documentation of her career. She had no manifest connection with her namesake state and never even visited there. No palace steamer inciting hyperbolic prose in the local newspapers as she moved from port to port bearing important passengers or cargo, *Indiana* worked almost exclusively behind the scenes, tramping people and pedestrian freight wherever and whenever a profit could be made. It is only today that her significance as a common carrier is recognized and appreciated.

In the mid-nineteenth century, Vermilion was a middling village on the banks of the river of the same name thirty-seven miles west of Cleveland on the southern shore of Lake Erie.[1] Named after the red clay river banks, Vermilion and its surrounding lands had been purchased in the 1770s from a consortium of Native Americans by the state of Connecticut as the Connecticut Western Reserve. Connecticut planned to offer land grants to the citizens of nine towns along its southern shore whose property had been destroyed by the British during the Revolution. Attracted by the fish, game, white oak timber stands, natural harbor, and other abundant natural resources, the first New England settlers arrived at Vermilion in 1808. The 30-ton schooner *Friendship*, the settlers' first locally built vessel, was constructed around 1809 by former New London, Connecticut ship captain William Austin, and shipbuilding soon became a major local industry. In the mid-1820s, the town established an ironworks using local iron ore, charcoal from the surrounding timberlands, and limestone from nearby Sandusky to manufacture agricultural, shipbuilding, and home products.

In 1834, Burton S. Goodsell established a shipyard on the western bank of the Vermilion River near its mouth; in 1838 he produced the newly-incorporated town's first steamboat, the 385–ton *Vermillion*. This was followed by the 104-ton schooner *South America* in 1841, for two local men named Alva Bradley and Ahira Cobb. The vessel proved successful, and the joint venture between Bradley and Cobb for *South America* inaugurated a most successful lifelong partnership.[2] Almost singlehandedly, they put Vermilion on the map as one of the most important ports on the southern shore of Lake Erie during the mid-nineteenth century.

Native New Englanders, Alva Bradley and Ahira Cobb[3] were well-suited for maritime enterprise. Bradley (1814–1885) was born in Ellington, Connecticut on 27 November 1814, the eldest of four children of farmer Leonard and Roxanna Bradley. The family worked on the Connecticut farm until 1823, when they migrated to Brownhelm, Ohio in search of better farmland in the Connecticut Western Reserve. Earlier in his life, Leonard had spent two years



Captain Alva Bradley (1814–1885) was *Indiana*'s first captain as well as one of her first owners. From E. M. Avery, *A History of Cleveland and Its Environs. The Heart of New Connecticut* (Chicago: Lewis Publishing, 1918).

in Brownhelm. This migration was Bradley's first recorded maritime experience, when the family booked passage aboard a canal boat from Albany to Buffalo, and thence on a sailing vessel to Cleveland in September 1823. Alva worked on his father's Ohio farm until the age of fifteen, also obtaining a limited public school education. He then shipped aboard the 50-ton schooner *Liberty* (possibly as cook's assistant), working his way up to mate in two years. After ascending the ranks aboard *Young Leopard*, *Edward Bancroft,* and *Express,* respectively, in 1839 Bradley became captain of the 15-ton sloop *Olive Branch*, subsequently becoming master of the schooner *Commodore Lawrence*.

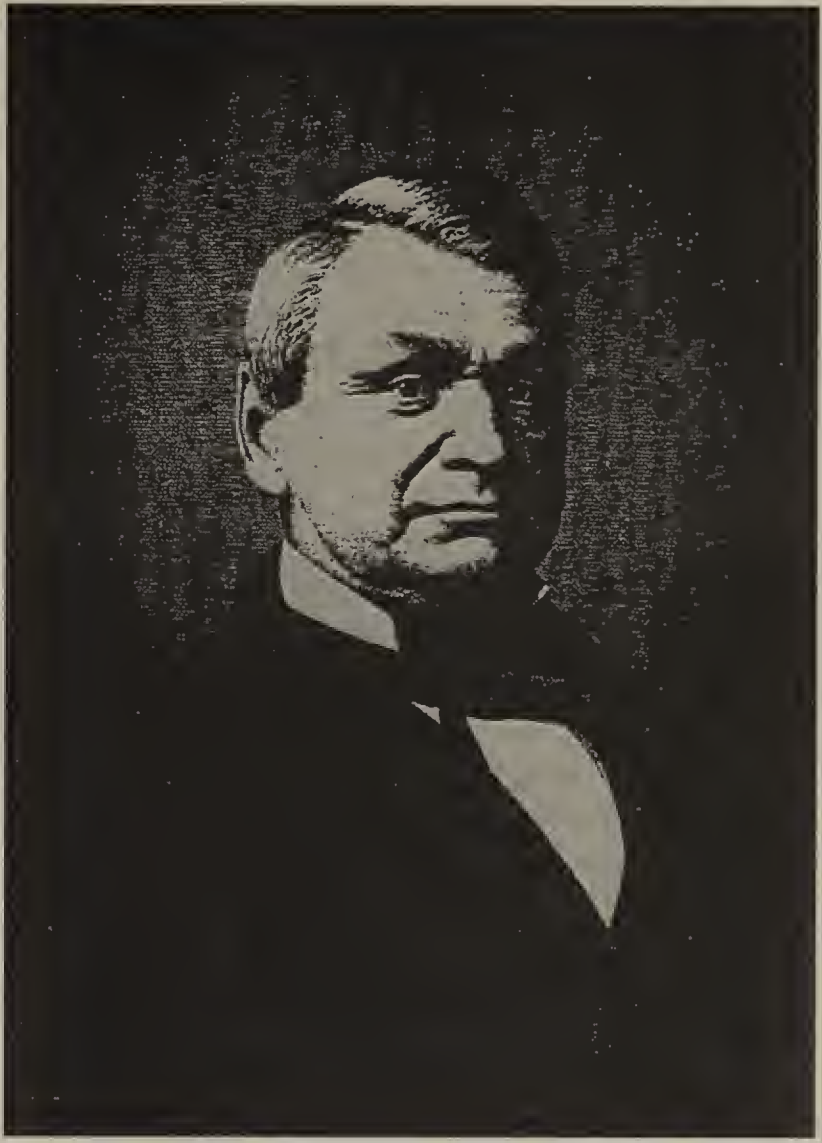
During this period, Alva Bradley undertook an act that would have far-reaching consequences for the future technological history of the United States. In December 1837, he transported (and befriended) a gentleman named Samuel Edison from Port Burwell, Ontario, on the northern shore of Lake Erie to Vermilion. Edison had been involved in the ill-fated Mackenzie Rebellion of 1837 in Vienna, Ontario and had narrowly escaped government authorities by hiding aboard Bradley's vessel. Indicted for treason, he subsequently moved to Detroit and then Milan, Ohio, where he set up a shingle mill. Eighteen months later, Bradley transported Edison's wife Nancy and their children from Ontario to Vermilion. In gratitude for Bradley's assistance, when their youngest son was born in 1847, the Edisons borrowed the captain's first name and named him Thomas Alva Edison.[4]

Also a Connecticut Yankee, Ahira Cobb (1812–1882) was born at Tolland, Connecticut on 12 October 1812 to Harriet and Jeduthan Cobb, Jr. Seven years later, the family migrated to Huron County, Ohio and bought a farm in the town of Norwalk. Unfortunately, Jeduthan died in 1827 and the family returned to Connecticut the following year. While attending school, Ahira studied tailoring in the evenings. Finding this profession unappealing, he returned to Norwalk and clerked at a general store for six years. In 1836, he formed a partnership with his employer and another man, opening a store in Birmingham under the name of Cobb, Hill & Co. The incorporated town failed in the financial depression of 1837, and Cobb was able to purchase its commercial assets a few years later.

He also had business interests in Vermilion, seven miles from Birmingham. Chief among these was the 1841 partnership with Captain Alva Bradley and Rodney Andrews of Brownhelm to build the 104-ton schooner *South America* at Burton Parsons' shipyard. Of the $3,200 of capital stock in the vessel, Cobb held $2,000, followed by Bradley with $700 and Andrews with $500. Bradley's share was augmented by a considerable amount of sweat equity, in the form of an agreement to serve as master of the vessel for as long as he held stock in her. This he did for three years; in 1844, the schooner was sold to his cousin Sheldon Bradley, who was lost aboard her with all hands in his second season of ownership. The Bradley-Cobb partnership inaugurated by *South America* yielded several other Vermilion-built sailing vessels in the ensuing years, including the schooner *Birmingham*, constructed by Burton Goodsell in 1843 and captained by Bradley for three years. In 1848, they commissioned the 185-ton schooner *Ellington*, built by Joseph M. Keating and Goodsell.

Sometime during the winter of 1847/48, Bradley and Cobb put together a consortium of five individuals to build the propeller *Indiana* at Vermilion, where the *Buffalo Morning Express* for 2 August 1847 suggests that shipbuilding was well developed. For the job, they contracted with shipbuilder Joseph M. Keating, who was living in Vermilion at the time and working for Burton Goodsell. An itinerant regional shipbuilder, Keating is best known today as builder of the ill-fated schooner *Alvin Clark* at Truago (now Trenton, near Detroit, Michigan) in 1846. She sank on 29 June 1864 off Green Bay, Wisconsin, and in 1969 was salvaged, refloated, and beached as a tourist attraction. After years of neglect, she was finally dismantled in 1994.[5] Keating also built the 873-ton sidewheel steamer *A. D. Patchin* at Truago in 1846; she, too, was an unlucky vessel, sinking in northern Lake Michigan in September 1850.[6] He first appeared in Vermilion in 1848, and sparse records indicate that he built two boats there that year: the schooner *Ellington* and the propeller *Indiana*.[7] He was associated with shipbuilder Burton Goodsell or worked at his yard, and some Vermilion sources attribute *Indiana* to Goodsell rather than Keating.[8] In 1849, Goodsell sold his yard to Isaac W. Nicholas and Alva Bradley and joined the California Gold Rush; Burton Parsons served as shipyard foreman thereafter.[9]

Indiana's earliest certificate of enrollment, placing her in the District of Sandusky, Ohio on 13 May 1848, lists her five owners as Erie County residents Ahira Cobb, Managing Owner; Alva Bradley; David Squire, and Theodore O. Chapman.[10] The sole New York owner was M. S. Hawley of Buffalo,[11] and Bradley is listed a second time on the document as Master. Of average size for the time, *Indiana*'s official measurements were recorded as 146' 6" x 23' x 10' 10" and 349-34/95 gross tons (old measurement). The wooden-hulled steamer originally had one mast, two decks, a straight stem, and round stern.



Ahira Cobb (1812–1882) was *Indiana*'s first managing owner and principal partner. From E. M. Avery, *A History of Cleveland and Its Environs. The Heart of New Connecticut* (Chicago: Lewis Publishing, 1918).

Indiana undertook 378 documented trips during her decade-long career, mostly between ports scattered around the lower Great Lakes. Many were sketchily recorded in the port news or marine columns of the regional newspapers, which provided an outline of daily port arrivals, clearances, cargoes carried, and for whom.[12] In general, easterly or downbound cargoes comprised mainly agricultural or mineral products, while westerly or upbound ladings consisted of manufactured goods or merchandise. What follows are annual activity summaries (voyages, cargoes, documented casualties, and other incidents); these synopses are intended not to represent an exhaustive chronicle of every voyage but rather to convey a sense of the general direction in which *Indiana*'s various owners steered her over her decade-long career — where a typical mid-nineteenth century Great Lakes screw steamer went, what she transported, and for whom.

Captain Bradley wasted no time in placing his new propeller into service. Only five days after her enrollment, *Indiana* arrived at the port of Buffalo on her maiden voyage bearing what would be a relatively typical downbound (easterly) cargo: 2,366 bushels of corn, 152 barrels of flour, seven barrels of pork, six black walnut logs, five kegs of butter, and thirteen rolls of leather for part-owner M. S. Hawley; 299 barrels of pork and eight kegs of lard for Hazard, Monteath & Sherman; eleven kegs of butter, one cask, six bales of hemp, and two boxes of sundries for P. Durfee & Co., and three boxes of castings for L. C. Mathews. *Indiana* returned to Vermilion only three times during her career, with two voyages documented for 1849 and one in 1850.

A majority of the 1848 sailing season was spent transporting general cargo between Buffalo at the east end of Lake Erie and Chicago at the southern end of Lake Michigan (a distance of ca. 1,000 miles), with occasional stops along the way at Milwaukee, Detroit, and St. Joseph. The later third of the season was restricted to the Buffalo–Detroit route. On 12 August, she was recorded "bound up at Manitous propeller Indiana with two canal boats in tow," — one of only two documented instances of her engagement in this activity.[13] Most of the year's cargoes were of a general and miscellaneous nature similar to the consignments listed above; one Buffalo–Chicago voyage was solely salt, two Detroit–Buffalo trips were all flour, two voyages transported only wheat and flour, and one trip with the owner aboard transported a walking beam engine from Chicago to Buffalo for the steamer *Michigan*. Cargo lists often mention freight for the "owner" and Niles & Wheeler of Buffalo. Hiram Niles, principal of the latter trading firm, was a future owner and frequent consignee of *Indiana* from the start, as well as a customer of many other Buffalo-bound merchant freighters in the 1840s and 1850s. Alva Bradley was sole captain during 1848.

Indiana spent the 1849 season under Captain Bradley once again, transporting general cargo between Buffalo and Chicago with occasional stops at Milwaukee, Detroit, Toledo, and Erie. The season opened in mid-April with the melting ice and formally closed at Buffalo on 17 December. Listed cargoes continue to mention frequent consignments for M. S. Hawley and Niles & Wheeler. The highlight of an otherwise uneventful season was a voyage from Detroit arriving at Buffalo on 10/11 November bearing "1 box minerals Zachary Taylor, president of the U.S."[14] These would have been ore samples; prior to the formation of the United States Geological Survey in 1879, ore samples were commonly sent to the President and Congress by speculators hoping for assays, land grants, or regional development. Many of these samples ended up in what is now the Department of Mineral Sciences at the Smithsonian Institution's National Museum of Natural History, but were destroyed in a fire in 1865. On the same voyage, 400 live hogs were herded aboard for a Buffalo customer. The sounds, sights, and smells of this living cargo on deck and below in the hold must have been unforgettable but profitable nonetheless, for *Indiana* recorded seven more trips with sizable quantities of live hogs between 1851 and 1856. *Indiana*'s last recorded 1849 clearance out of Buffalo was on 3/4 December for Toledo, and she appears to have wintered at Vermilion that year.

The 1850 season began late for *Indiana*, with a trip from Vermilion arriving at Buffalo on 9/10 May with a cargo consigned mostly to M. S. Hawley. A classified advertisement in the *Buffalo Morning Express* for 11 May 1850 advertised *Indiana* service to the Lake Erie ports of Dunkirk, Erie, Conneaut, Ashtabula, Fairport, and Cleveland, departing at 8:00 PM; however, round trips between Buffalo and Detroit dominated most of that year's voyages. The annual cargoes were characterized by frequent consignments for Hawley, Niles & Wheeler, and another future owner from Buffalo, Lucius H. Pratt. Two voyages in June and mid-October were exclusively devoted to wheat and flour, respectively; the remaining year's trips carried general cargoes. One trip from Detroit to Buffalo in mid-August transported *Indiana*'s first Lake Superior ore cargo: "13 tons copper from Minesota [sic] mine Lake Superior, Sternberg & co."

Alva Bradley served as Captain from May through most of October. At the end of that month and for the remainder of the season, he relinquished command to Captain A. B. Conkey, who undertook four Buffalo–Detroit trips before ending the season at Buffalo on 30 November. This last voyage, which coincidentally transported consignments for all four sets of *Indiana*'s owners listed in this paragraph ended about a month before the end of the regular sailing season and the annual disappearance of the port activity column in the Buffalo newspapers, marking a conservative sailing season that *Indiana*'s owners would follow throughout her career.

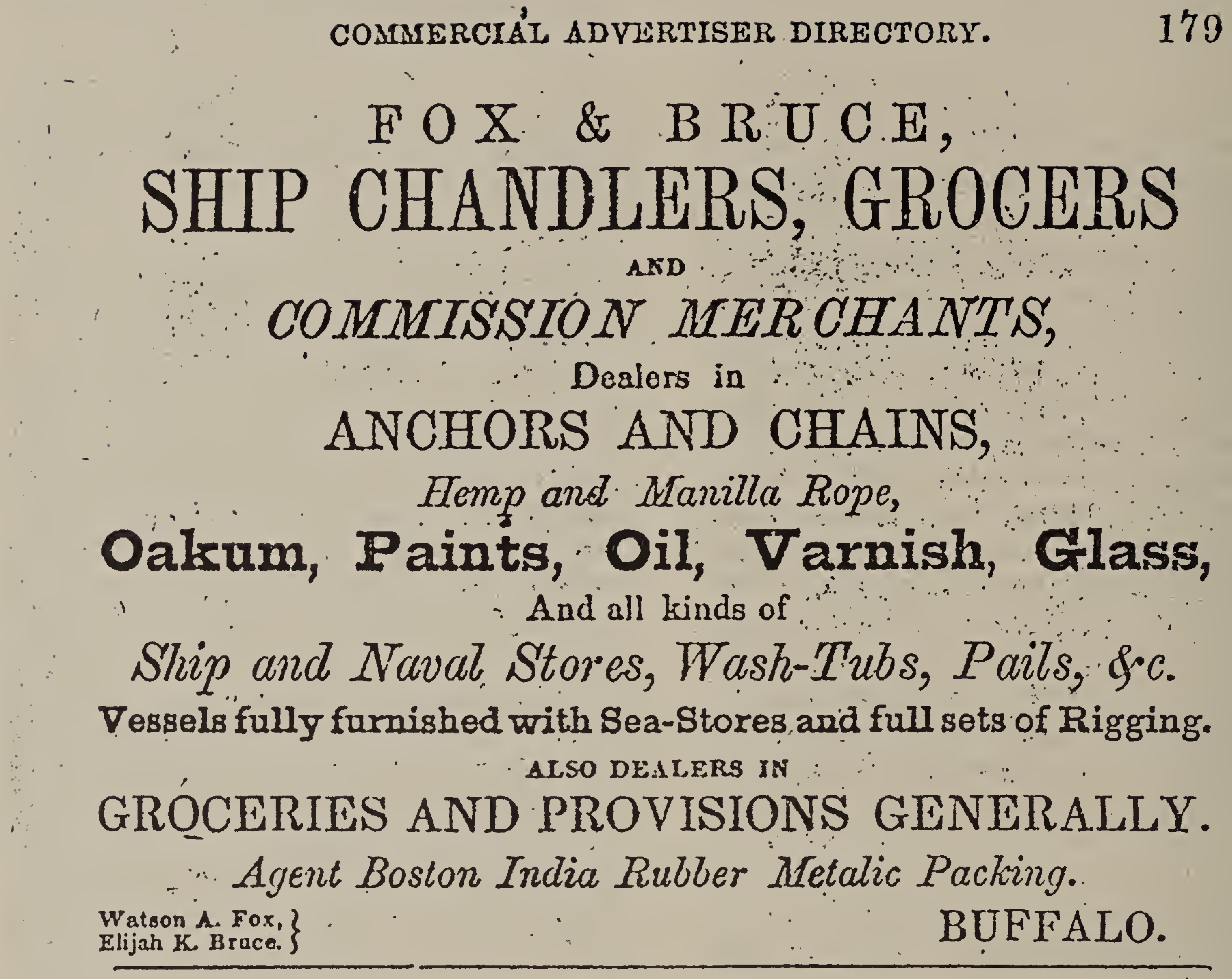
The 1851 sailing season opened for *Indiana* with a Buffalo clearance on 9/10 April for Detroit under Conkey. Nearly the entire season, comprising around fifty trips between ports, was in the Detroit–Buffalo trade on Lake Erie, with rare stops at Cleveland, Chicago, Tonawanda, Toledo, and Monroe. Despite the regularity of ports visited, it was another year of tramping, for there was not a single advertisement throughout the year offering scheduled service between ports.

On 21 April, the propeller underwent the first of several casualties during her career, in the form of a close encounter with the schooner *Cambria* in Lake Erie in which the schooner's bowsprit was carried away. However, overall damage to the two vessels was light (with a loss of $200), and *Indiana* resumed sailing virtually without interruption. Captain Conkey was replaced on 9 July by Captain Kline for the rest of the year, which ended with a voyage from Toledo to Buffalo arriving 1 December. Cargoes remained a combination of general freight, commodities, grains, vegetables, and miscellaneous items consigned to the same general individuals and partnerships as before.

Just before the beginning of the 1852 sailing season, *Indiana*'s Sandusky enrollment was surrendered and the propeller was re-enrolled at Buffalo on 26 March 1852. The reason for this was her sale to Lucius H. Pratt (two-thirds) and Hiram Niles (one-third) of Buffalo. The enrollment document names Pratt as Master.

Lucius H. Pratt was one of the original members of the Buffalo Board of Trade, established in 1845 "for the facilitation of the Commerce of Buffalo, and settlement of differences unavoidably arising between its members, particularly...in the produce market."[15] Buffalo city directories for the period contain his classified advertisements as a wholesale and retail dealer in groceries, paints, powder, and shot, etc. and list him as a commission merchant, but he was also heavily involved in the shipping industry. In 1848, he owned the steamer *Baltic*, and in 1850, he and Niles owned the Fairport, Ohio-built propeller *Monticello.* He and another partner acquired the new Buffalo-built propeller *Buffalo* in 1851, and the following year in addition to *Indiana*, he acquired a majority interest in the propeller *Bucephalus*, built in 1852 at Perrysburg, Ohio. He also owned the schooner *Mavice* (or *T. W. Mavrice*), which was lost in early June 1852.[16]

Hiram Niles of the merchant firm Niles & Wheeler left little trace of his life in Buffalo. His company was one of *Indiana*'s most loyal consignees throughout her career, and the company name appears frequently on the ladings of other Buffalo steamers as well. However, the firm did not advertise in the Buffalo city directories. Aside from his partnership with Lucius Pratt, he also was full or part owner of the propellers *Montezuma* in 1848, *Ohio* in 1851 and 1853, *Cataract* in 1852, and *Queen of the Lakes* in 1853.[17] In 1854, Niles & Wheeler were listed as co-proprietors of the American Transportation Company; in 1855, Niles was listed as that firm's Vice President. In 1855, he was a member of the Reference Committee of the Board of Trade, in 1857, he served as a director of the Buffalo Division of the New York and



COMMERCIAL ADVERTISER DIRECTORY. 179

FOX & BRUCE,

SHIP CHANDLERS, GROCERS

AND

COMMISSION MERCHANTS,

Dealers in

ANCHORS AND CHAINS,

Hemp and Manilla Rope,

Oakum, Paints, Oil, Varnish, Glass,

And all kinds of

Ship and Naval Stores, Wash-Tubs, Pails, &c.

Vessels fully furnished with Sea-Stores and full sets of Rigging.

ALSO DEALERS IN

GROCERIES AND PROVISIONS GENERALLY.

Agent Boston India Rubber Metalic Packing.

Watson A. Fox,
Elijah K. Bruce.

BUFFALO.

Watson A. Fox had several simultaneous careers. In the *Buffalo City Directory* for 1849/1850, he placed a half-page classified advertisement for Fox & Bruce, "Ship Chandlers, Grocers and Commission Merchants, Dealers in Anchors and Chains, Hemp and Manilla Rope, Oakum, Paints, Oil, Varnish, Glass, and all kinds of Ship and Naval Stores..."

Erie Railroad, and the following year, he was listed with the firm of Walker, Massey & Co. rather than Niles & Wheeler, perhaps indicating the dissolution of that partnership.[18]

Despite the early 1852 enrollment naming Pratt as *Indiana*'s master, he never served in this capacity. Instead, Captain Spencer opened the season on 22 April with a clearance from Buffalo for Sandusky. This port saw the propeller five times that year of tramp work, as did Detroit; Toledo saw her fourteen times, and Cleveland once. Spencer remained *Indiana*'s master throughout the year spent on Lake Erie until the last arrival at Buffalo from Detroit on 29 November under Captain F. Keith.[25]

Aside from Bradley, Niles & Wheeler, and L. H. Pratt, an entirely new group of consignees appeared in the 1852 cargo listings; most of these were individuals or partnerships, but there was one new client that would later prove significant. On her third voyage of the year, arriving at Toledo from Buffalo on 12 May, *Indiana* transported 217 packages of merchandise "for M. S. R. R. Company." This was the Michigan Southern (and Northern Indiana) Railroad, and it was *Indiana*'s first cargo for what would prove to be the single biggest enemy ever known to waterborne trade and traffic in the Great Lakes and elsewhere in the United States. *Indiana*transported six more railroad consignments from Buffalo to Toledo that year, and it is interesting to speculate whether her owners and other regional shippers had any idea that in a few short years many of them would be put out of business by, or working for, the patrons they served so faithfully.[20]

Indiana's 1852 cargoes remained essentially unchanged from the previous year's. One July trip transported solely wheat and three others were monopolized by L. H. Pratt. There was some increase in the upbound transport of such durable goods as wagons, hardware, door shims, furniture, machinery, castings, and glass, all indicative of increasing westward migration, settlement, and economic development. One other noticeable trend among 1852 cargoes is a dramatic increase in *Indiana*'s carriage of large quantities of packages and boxes of "merchandise" to various destinations, mainly westbound. Interpretation of this trend beyond that offered for the above durable goods is difficult, without knowing more about the nature of the merchandise.

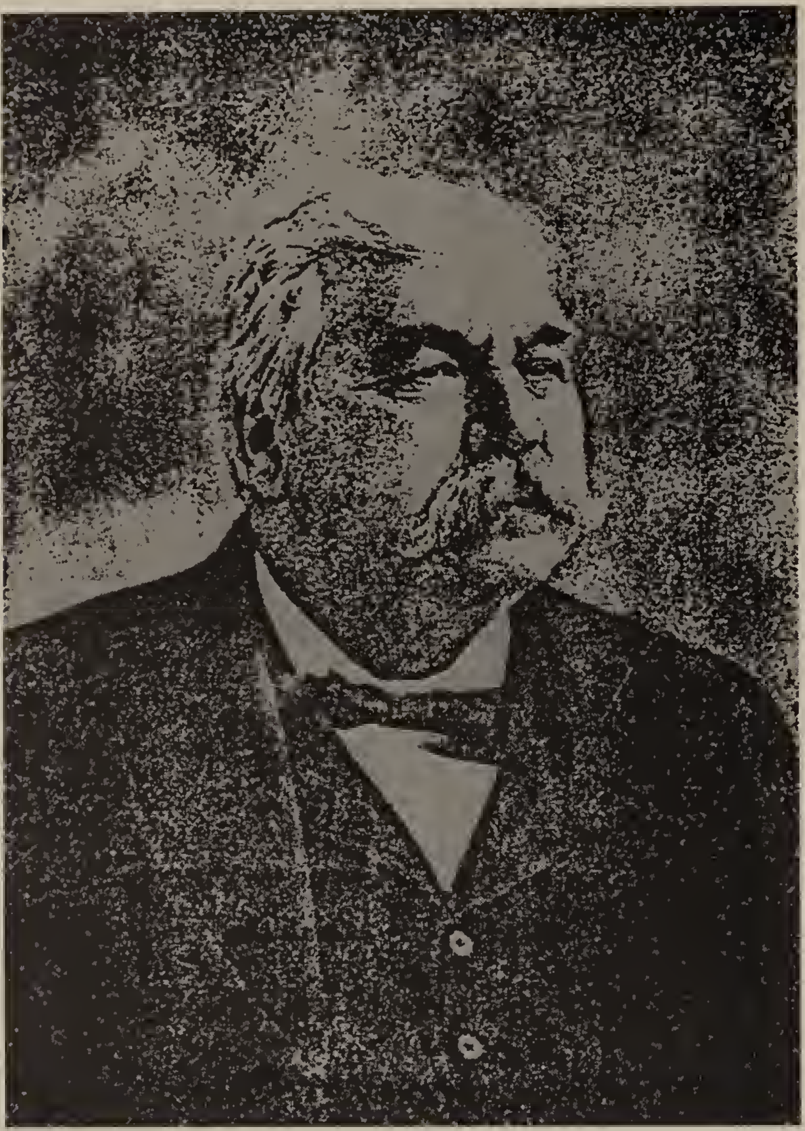
On 1 April 1853, *Indiana* was re-enrolled at Buffalo as the result of the sale of Hiram Niles' third of the propeller to Lucius Pratt, now full owner. The following day, Pratt placed a classified advertisement in the *Buffalo Morning Express* offering service to Cleveland, Sandusky, and Toledo "on the opening of Navigation." Competition along this particular route was strong, as indicated by the propellers *Pocahontas* and *Sandusky* offering exactly the same service. On 6 April, *Indiana* cleared Buffalo for Toledo under Captain Franklin Cameron with a cargo of hundreds of packages of merchandise, nearly half of which was for the "R. R. Company." Toledo was *Indiana*'s principal port of call for 1853; she visited Monroe seven times, and Cleveland and Sandusky once each. With the exception of a single Monroe–Buffalo trip at the end of October under Captain Keith, Cameron retained mastery through the last trip to Buffalo ending 29 November.

Pratt's propeller apparently thrived alongside the competition in 1853. That year, she either carried merchandise or other cargoes, but not both simultaneously. Although all fourteen trips from Buffalo to Toledo were dedicated exclusively to the transportation of large quantities of merchandise, consumables and raw materials overtook durable goods to and from the other ports. One return trip from Toledo to Buffalo bore only 9,600 bushels of corn; two July trips from Monroe to Buffalo carried ninety-nine sheep and 188 hogs, respectively. Buffalo-bound grains (wheat, corn, and oats) and flour grew in quantities, as did animal skins (variously called leather, hides, skins, or pelts), processed meats, and other animal products (beef, pork, hams, shoulders, lard, bacon, hair, bristles. and wool).[21] *Indiana* served Buffalo's intellectual interests for the first time in 1853 with two shipments of books totaling twenty-two boxes from Toledo, but she also transported small quantities of tobacco and considerable amounts of whiskey around Lake Erie that year, perhaps offsetting the moral gains. Otherworldly interests also were served that year, when she transported "400 coffin bottoms, 145 boxes coffin stuff" from Toledo to Buffalo in early July.

There is a hint of a casualty in *Indiana*'s 1853 season. The "Marine News" column of the *Buffalo Morning Advertiser* for 31 October 1853 carried news of the loss of the steamer *Minnesota* eastbound for Buffalo from Chicago the previous evening:

> *When opposite the stone quarries near Malden, she ran on the sunken rock that is in the river at that place and immediately sank in about 16 feet water...This rock is the one Indiana and one or two other boats have run against. The night was thick and rather foggy, which was the cause of the boat keeping rather too close to the Canada shore.*[22]

For reasons known only to himself, Lucius Pratt sold *Indiana* on 11 November to Samuel F. Pratt of Buffalo, and she was re-enrolled at that port for the second time that year due to the change in owners. Although sharing the same surname, the two men were not closely related, possibly being cousins or more distant relatives. Samuel Fletcher Pratt (1807–1872) was born outside Buffalo, the elder of two sons of Samuel Pratt, Jr. He began working for a



Francis Perew (1825–1898) was *Indiana*'s last owner. She was first among his many fully-owned vessels during his career as boat captain and owner. From L. B. Lane, *A Memorial and Family History of Erie County* (Buffalo: Genealogical Publishing, 1906–08).

Canadian merchant at the age of twelve; shortly thereafter he worked for the Buffalo firm of G. & T. Weed. A partner by the age of twenty, he became sole owner of this firm ten years later.

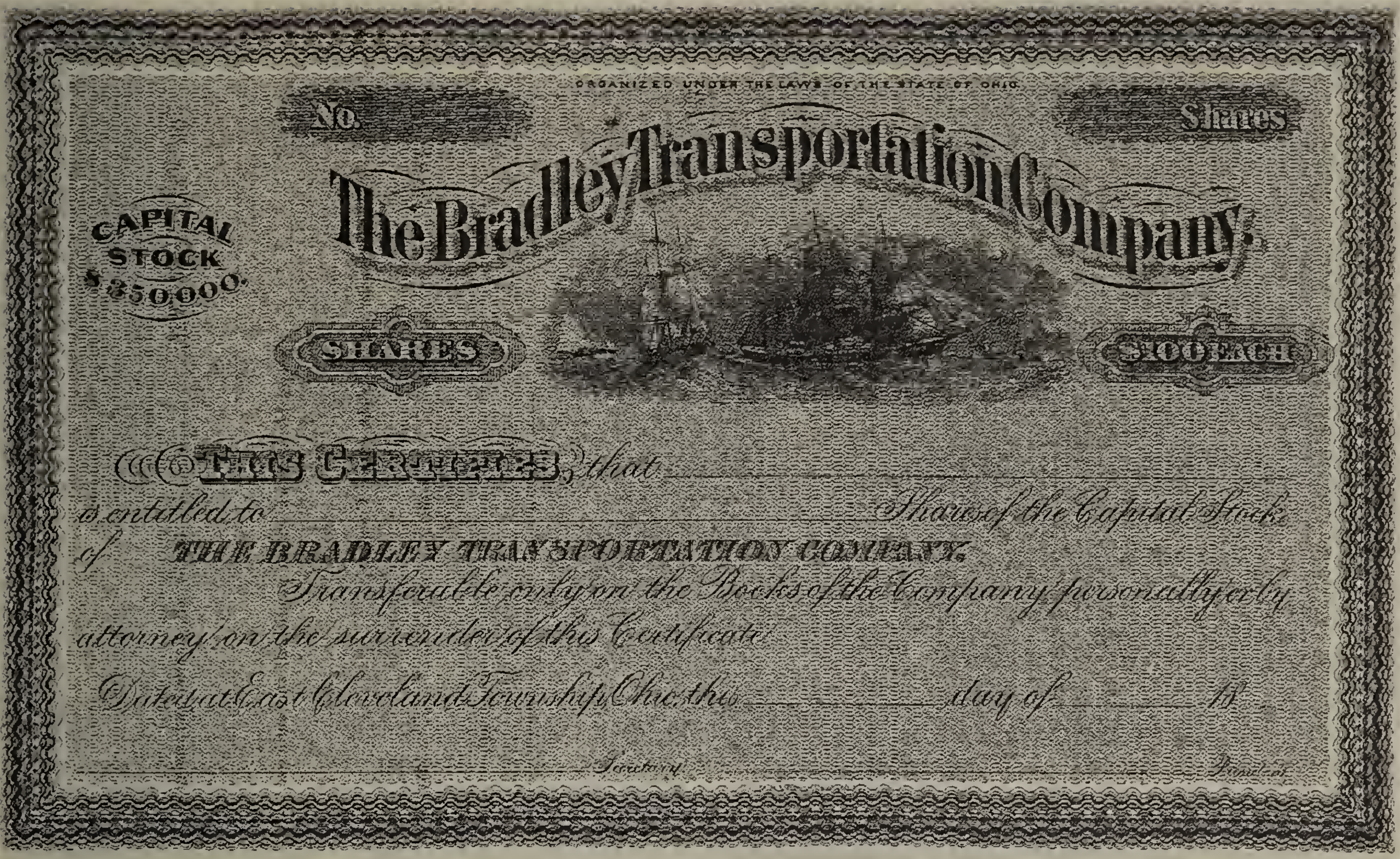
In 1847, Samuel F. Pratt was a director of the Buffalo Board of Trade, and the following year he became its Second Vice President. The commercial city directories for the period contain half page advertisements for Pratt & Co., "Importers and Dealers in Foreign and Domestic Hardware," naming Samuel F. Pratt, his brother Pascal P. Pratt, and Edward P. Beals as proprietors.[23] In 1849, he also co-owned with Jacob Imson the Cleveland-built steamer *Hendrick Hudson*, built in 1846 and measuring 204.6' in length and 750 tons — a large vessel for her time and place. He was the first President of the Buffalo Gas Works, established in 1848 to light the streets of Buffalo, and by 1852 was its President, Treasurer. and Director. He was also President of the first Board of Trustees of the Buffalo Female Academy. By the mid-1850s, Pratt, his brother Pascal, and William P. Letchworth were partners of Pratt & Letchworth, "Manufacturers, Importers, and Dealers in Every Description of Saddlery, Carriage, Coach and Trunk Hardware."

A few days after Samuel Pratt purchased her, *Indiana* was involved in another casualty, but this time as salvor rather than victim. The "Marine News" column of the *Buffalo Morning Advertiser* for 21 November, citing a report from Monroe of 19 November, states:

> *ASHORE. — The schooner* Hope, *Capt TRAVERSE, with a cargo of Railroad iron and bound for Chicago, went ashore on Wednesday night last on Bass Island. She has been stripped and her rigging was brought to Port by the Propeller* Indiana.

The incident was confirmed by *Indiana*'s arrival at Buffalo on 19/20 November with a standard cargo listing, to which was added "...rigging of schooner Hope wrecked at Bass Island."

Aside from the year of her loss, 1854 was undoubtedly the most active and unusual in *Indiana*'s peripatetic career. For unknown reasons, Samuel Pratt had enough of the propeller after less than two months' ownership (and only eighteen days sailing time), placing a classified ad throughout the month of January in the Buffalo newspapers offering her for sale through L. H. Pratt. She was purchased for an unknown sum and re-enrolled at Buffalo on 12 April to new owners W. A. Fox & Company (half). Watson A. Fox was listed as Managing Owner, and his partner in the eponymous company was William A. Shepard of the City of New York. Francis Perew purchased the other half and was listed as Master on the enrollment document. It is possible that between the dates of purchase and re-enrollment, or possibly earlier, *Indiana* may have been substantially altered, for the 1854 enrollment document describes her with one deck and two masts.



ORGANIZED UNDER THE LAWS OF THE STATE OF OHIO.

No. Shares

The Bradley Transportation Company.

CAPITAL STOCK $350000.

SHARES $100 EACH

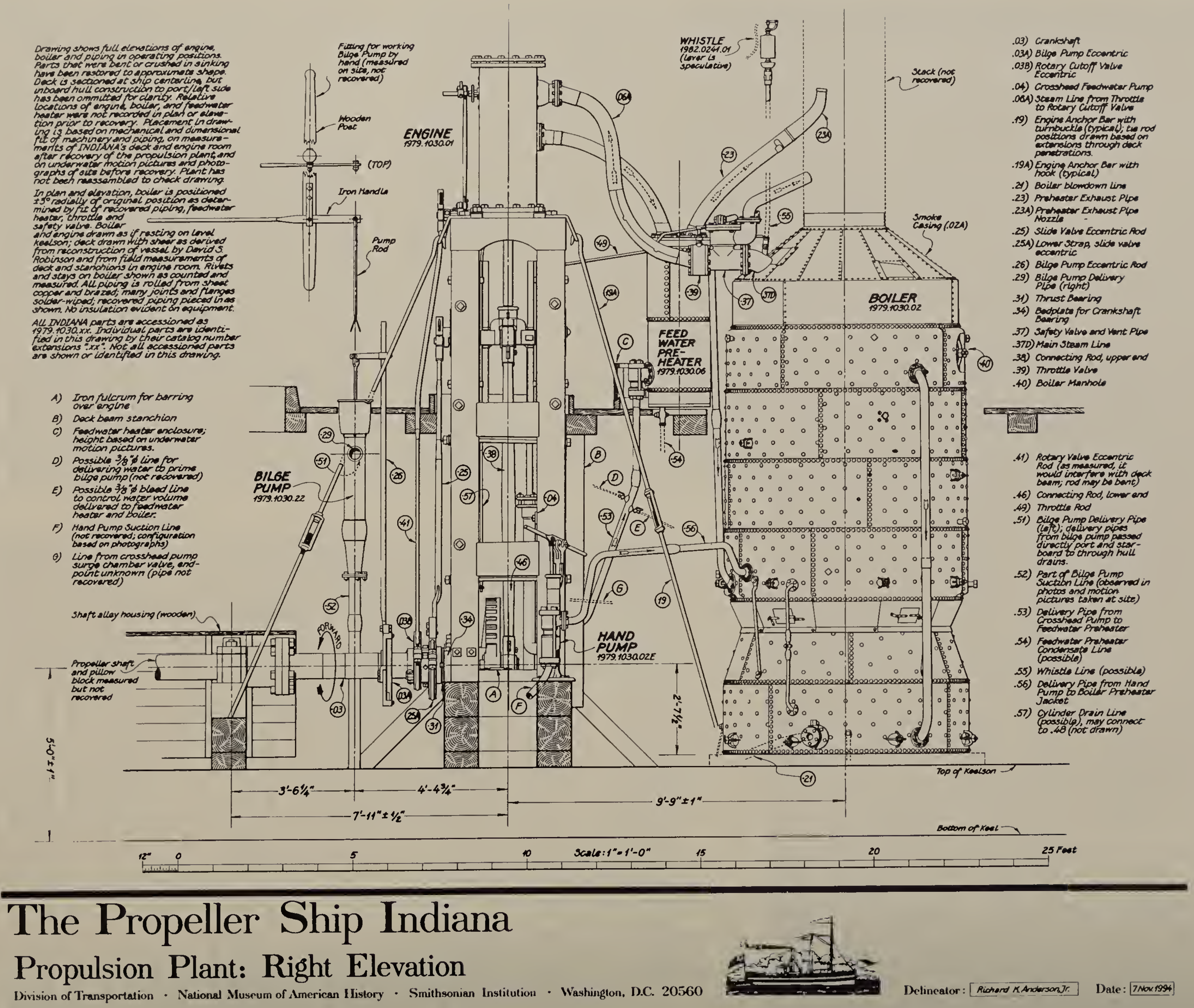
This Certifies, that
is entitled to Shares of the Capital Stock
of THE BRADLEY TRANSPORTATION COMPANY.
Transferable only on the Books of the Company personally or by
attorney on the surrender of this Certificate.
Dated at East Cleveland Township, Ohio, this day of 18
Secretary President

Stock certificate of the Bradley Transportation Company. Photograph courtesy of Jack Messmer.

Like many other Buffalo merchants, Watson A. Fox had several simultaneous careers. In the city directory for 1847/48, he was listed with the firm of Dole, Fox & Bruce, but in the 1849/50 edition, he had a half page classified advertisement for Fox & Bruce, “Ship Chandlers, Grocers and Commission Merchants, Dealers in Anchors and Chains, Hemp and Manilla Rope, Oakum, Paints, Oil, Varnish, Glass, and all kinds of Ship and Naval Stores…” In 1850, he and his partner Elijah K. Bruce co-owned the Huron-built sidewheel steamer *Charter*, measuring 132' in length and 197 tons; that same year, he was certified as an agent for the Columbus Insurance Company and authorized to sell fire and marine insurance. The following year, Watson A. Fox & Co. owned outright the sizable steamer *Great Western*, also built at Huron (1838) and measuring 186' and 780 tons.[24]

In the 1853 city directory, Fox took out a full page advertisement offering his services as a forwarding and commission merchant, insurance agent, and proprietor of the New York and Lake Erie Line of six brigs, six schooners, and the “propeller” *Charter*; he also owned the schooner *Excelsior*.[25] In early March 1854, he was appointed a member of the Buffalo Marine Convention, a committee assembled to undertake various political, navigational, and insurance matters affecting regional shipping.[26] The following month, 23 April, he took out a classified advertisement in the “Commission Merchant” column of the *Cleveland Morning Ledger* listing himself as co-proprietor (with W. A. Shepard) of the New York and Lake Erie Line (via Buffalo).

Aside from Keating, Cobb and Bradley, Francis Perew (1825–1898) was the single most important individual in the propeller *Indiana*’s life. He was born at Clayton, New York, in the northeastern corner of Lake Ontario, to Felix Perew and his wife, both French immigrants. Armed with a public school education, at the age of seventeen he went to work on his first vessel. The following year, he joined the crew of the schooner *John Porter* of Buffalo. Evincing considerable aptitude, he became mate of a small Cleveland schooner in 1845, where he remained until 1847. In that year, he built and part-owned the Cleveland schooner *Kosciusko*,



Drawing shows full elevations of engine, boiler and piping in operating positions. Parts that were bent or crushed in sinking have been restored to approximate shape. Deck is sectioned at ship centerline, but inboard hull construction to port/left side has been ommitted for clarity. Relative locations of engine, boiler, and feedwater heater were not recorded in plan or elevation prior to recovery. Placement in drawing is based on mechanical and dimensional fit of machinery and piping, on measurements of INDIANA's deck and engine room after recovery of the propulsion plant, and on underwater motion pictures and photographs of site before recovery. Plant has not been reassembled to check drawing.

In plan and elevation, boiler is positioned ±5° radially of original position as determined by fit of recovered piping, feedwater heater, throttle and safety valve. Boiler and engine drawn as if resting on level keelson; deck drawn with sheer as derived from reconstruction of vessel by David S. Robinson and from field measurements of deck and stanchions in engine room. Rivets and stays on boiler shown as counted and measured. All piping is rolled from sheet copper and brazed; many joints and flanges solder-wiped; recovered piping pieced in as shown. No insulation evident on equipment.

All INDIANA parts are accessioned as 1979.1030.xx. Individual parts are identified in this drawing by their catalog number extensions ".xx". Not all accessioned parts are shown or identified in this drawing.

A) Iron fulcrum for barring over engine
B) Deck beam stanchion
C) Feedwater heater enclosure; height based on underwater motion pictures.
D) Possible 3/8"ϕ line for delivering water to prime bilge pump (not recovered)
E) Possible 3/8"ϕ bleed line to control water volume delivered to feedwater heater and boiler.
F) Hand Pump Suction Line (not recovered; configuration based on photographs)
G) Line from crosshead pump surge chamber valve, endpoint unknown (pipe not recovered)

.03) Crankshaft
.03A) Bilge Pump Eccentric
.03B) Rotary Cutoff Valve Eccentric
.04) Crosshead Feedwater Pump
.06A) Steam Line from Throttle to Rotary Cutoff Valve
.19) Engine Anchor Bar with turnbuckle (typical); tie rod positions drawn based on extensions through deck penetrations.
.19A) Engine Anchor Bar with hook (typical)
.21) Boiler blowdown Line
.23) Preheater Exhaust Pipe
.23A) Preheater Exhaust Pipe Nozzle
.25) Slide Valve Eccentric Rod
.25A) Lower Strap, slide valve eccentric
.26) Bilge Pump Eccentric Rod
.29) Bilge Pump Delivery Pipe (right)
.31) Thrust Bearing
.34) Bedplate for Crankshaft Bearing
.37) Safety Valve and Vent Pipe
.37D) Main Steam Line
.38) Connecting Rod, upper end
.39) Throttle Valve
.40) Boiler Manhole
.41) Rotary Valve Eccentric Rod (as measured, it would interfere with deck beam; rod may be bent)
.46) Connecting Rod, lower end
.49) Throttle Rod
.51) Bilge Pump Delivery Pipe (left); delivery pipes from bilge pump passed directly port and starboard to through hull drains.
.52) Part of Bilge Pump Suction Line (observed in photos and motion pictures taken at site)
.53) Delivery Pipe from Crosshead Pump to Feedwater Preheater
.54) Feedwater Preheater Condensate Line (possible)
.55) Whistle Line (possible)
.56) Delivery Pipe from Hand Pump to Boiler Preheater Jacket
.57) Cylinder Drain Line (possible), may connect to .48 (not drawn)

The Propeller Ship Indiana

Propulsion Plant: Right Elevation

Division of Transportation · National Museum of American History · Smithsonian Institution · Washington, D.C. 20560

Delineator: Richard K. Anderson, Jr. Date: 7 Nov 1994

Reconstructed engine and boiler arrangement aboard *Indiana*. Drawing by Richard K. Anderson, Jr.

serving as master until late 1850. At that point. he made the transition to steamboats, captaining the steamer *Belle* of Buffalo. *Belle*, *Fashion*, and others formed the Walbridge's Cleveland and Buffalo Line, a small line of steamboats operating between Cleveland, Buffalo, and intermediate ports on Lake Erie.[27] Perew probably was familiar with *Indiana* at least as early as 1850, for she and *Kosciusko* were at Cleveland together on 16 May and 23 July of that year, and Perew, on *Belle*, and *Indiana* were together at Buffalo several times thereafter.[28]

Perew remained master of *Belle* through late 1852 without serious incident.[29] Toward the end of October, he took over as master and part-owner of the new 650-ton propeller *Nile*, built at Ohio City by Moses & Quayle and engined by the Buffalo Steam Engine Works. She entered the Buffalo–Chicago trade transporting general cargoes in November 1852, just before the end of the sailing season, and resumed the same schedule the following April, adding intermediate ports to her schedule. However, business was slow, for on 2 July 1853, two separate classified advertisements appeared in the *Buffalo Morning Express* offering *Nile*'s services. Although both advertised Buffalo–Chicago service, they are otherwise different — particularly unusual since they ostensibly compete with one another. The smaller simply offers passage for Chicago and intermediate ports aboard *Nile* for a single voyage departing at 8:00 PM on Monday, 4 July. The larger lists *Nile* as one of three regular Monday departures for Chicago as a member of the nine-ship Pioneer Line of Propellers; among the dozen agents listed are Niles & Wheeler, L.H. Pratt, Seymour & Wells, and W.A. Fox & Co.[30]

This sort of competition led to a certain amount of risk for greater glory, for in mid-August, Perew and *Nile* engaged in a "trial of speed" from Chicago to Milwaukee with their fellow Pioneer liner *Forest City*, beating her by twenty-seven minutes.[30] Perhaps it was this sort of activity that had led to the critical remark, "Lake Erie appears to be prolific with steamboat accidents. Surely Buffalo produces a ricketty lot of steamboats and reckless officers."[31]

Indiana's owners Fox and Perew lost little time in putting their new acquisition into service in 1854. Four days before formally re-enrolled in their names, she was promoted in magnificent classified advertisements in the Buffalo newspapers and city directories as one of thirteen ships in the Clipper Line. Fox named himself as Proprietor and principal agent, not neglecting to mention his New York and Erie Line as well.[32] Precisely one week after her purchase on 12 April, the propeller cleared Buffalo for Cleveland. The round trip was completed in five days, and *Indiana* turned around almost immediately and cleared Buffalo on 25/26 April for the same destination. A day or so later, a northwest gale hit the southern shore of Lake Erie. The *Cleveland Morning Leader* for 28 April describes *Indiana*'s third casualty, which occurred only fifteen days after Perew and Fox bought the propeller:

> *"Yesterday morning as the Propeller* Indiana *was making this port, during the gale, her machinery became deranged, and she was carried against the unfinished pier on the west side. A line was instantly carried across the river, and by the aid of the spectators she was extricated from her perilous situation. She was not materially injured."*

The next day *Indiana*'s diagnosis worsened significantly, with the *Cleveland Morning Ledger* for 29 April 1854 reporting: "The Propeller *Indiana* has gone into the dry dock for repairs. She leaked considerably." It may be assumed that the "deranged machinery" which initiated the Cleveland incident also was set in order, and it is interesting to speculate what this use of the passive voice without human intervention might signify. It is certainly possible that some element of the machinery simply may have broken down at an inopportune moment. It is also possible that human error, perhaps caused by unfamiliarity on the part of Capt. Perew or a new crew with the internal workings of his new propeller's machinery, may have been a factor in the brush with the Cleveland pier. The property loss for this encounter was $1,500.[34]

It is further possible that around or slightly before the time of these repairs, *Indiana* was cut down to one deck and rerigged with two masts, as in the 1854 and 1855 enrollments she was recorded with one deck and two masts and in 1858 with one deck and one mast. Prior enrollments (1848, 1852, and 1853) list two decks and one mast. However, since *Indiana*'s gross tonnage remained constant throughout her career, it is also possible that different inspection standards were applied at different ports of enrollment and that there were no substantive changes to her size and rig during this period. Her crew size was reported as eighteen during the 1854 season.[34]

In any event, by 11 May *Indiana* was back in service. In early June, she began making round trips between Cleveland and Sault Sainte Marie, Michigan, transporting mainly copper and iron ore from the newly opened mines around Lake Superior in Michigan down to processing plants at Cleveland. These round trips in the year before the Sault lock opened took between ten days and two weeks, and continued regularly and uneventfully until 22 August, when she assisted in the rescue of the steamer *Baltic* from a grounding in Lake Huron. The incident prompted public and profuse thanks in the form of an open letter to readers of the *Buffalo Morning Express* for 7 September 1854 and other regional newspapers:[35]

> *A CARD — The undersigned, Master of steamer Baltic, begs leave to tender his sincere thanks to Capt. Perew, of the Propeller Indiana, Capt. Napier of Propeller Forest Queen, and Capt. Stewart, of Steamer Michigan, for their prompt and persevering assistance with their respective crafts in relieving said Baltic from her dangerous situation on Middle Island Reef, Lake Huron; (more particularly to Captain Perew for remaining and assisting until the Baltic was again afloat.) August 22d, ult. The undersigned hopes that neither of the abovve [sic] named will ever need his services on a similar occasion, but in that or any other event their kindness will be gratefully remembered.*
>
> *JAMES M. AVERILL,*
> *Buffalo, September 6, 1854.*

The end of *Indiana*'s 1854 season confirmed the old adage that no good deed goes unpunished. On 28 October, the propeller was reported "hard ashore on the rocks in St. Mary's River" (at the Sault) by the steamer *Superior* out of Chicago; the property loss was subsequently reported at $500.[36] This effectively ended the year for *Indiana*. She wintered at Buffalo and presumably underwent necessary repairs from her first year under Perew, for she was reported among a list of vessels wintering at Buffalo "ready for the present season" in the *Buffalo Morning Express* for 29 March 1855.

Despite his episodic bad luck with *Indiana* in 1854, Perew must have been generally pleased with her performance, for he bought out Fox & Co.'s half interest in the spring and reenrolled her on 5 May 1855 at Buffalo with himself as sole owner and master. *Indiana* was his first fully owned vessel.[37] Over the winter, he also developed a new sailing strategy that omitted Lake Huron in favor of the more familiar waters of Lake Erie, for on the same day she was enrolled, a classified advertisement appeared in the Buffalo *Democracy* offering regular service by *Indiana* to Buffalo, Sandusky, and Toledo with the People's Line. The propellers *Ogontz* and *Delaware* joined *Indiana* in this People's branch, offering regular departures from Buffalo on Tuesdays, Thursdays, and Saturdays.

The sailing season began late in 1855 due to ice. *Indiana*'s first Buffalo clearance of the year occurred on 6 May, for Toledo. She resumed the transportation of general cargoes rather than the previous year's ore. One mid-May voyage from Toledo to Buffalo bore 700 live hogs for Perew, as well as hundreds of barrels of pork, hams, shoulders, and lard, as well as beef and venison for various consignees. Later that month, one trip on the same route carried no fewer than 800 live hogs — presumably stuffed into every imaginable space under considerable protest — and 206 barrels of pork for Perew's account, along with hundreds more barrels of pork, lard and hams for others. In late September, another Buffalo client received 169 more live hogs from Toledo, and three barrels of bacon on the same trip went to yet another Buffalonian.

Large quantities of flour poured into Buffalo in *Indiana*'s hold from western Lake Erie ports, especially Sandusky, along with other grains (corn, seed, flax, timothy, nuts); one June trip transported solely 10,000 bushels of corn from Chicago to Buffalo. Large amounts of whiskey in barrels, with smaller amounts of beer, ale, and wine also moved easterly that year. Surprisingly late in the regional growing season, a late October voyage to Buffalo was devoted exclusively to "produce" from Toledo. Although this particular cargo was not broken down by contents, other voyages bearing small quantities of other such goods suggest that potatoes, apples, other fruits, eggs, and butter might have been included in this generic category. Although it has not been mentioned before, small but steady amounts of ashes also were transported to Buffalo from the west in this and other years.[38] Generic "merchandise" or "sundries" were sole cargoes for three westbound voyages during the year.

There is no manifest pattern among consignees for the year. Most were new or occasional appearances with the exception of the (New York) Central Railroad, a small but steady customer in Buffalo from parts west. Perew transported to Buffalo three types of cargo on his own account as owner, including 1,500 live hogs, 206 barrels of pork, and 1,413 barrels of flour. *Indiana*'s 1855 season concluded uneventfully with a trip from Toledo to Buffalo arriving 20 November.

Over the winter of 1855/56, Perew modified *Indiana*'s sailing strategy once again. The propeller spent the entire 1856 season in southern Lake Erie traveling between Buffalo and Cleveland, essentially providing packet service (cargoes to Cleveland were very light). Most of the season, her principal competitors for freights were the steamers *Crescent City* and *Queen of the West*.[39] Easterly cargoes to Buffalo remained a miscellany, with flour — as always — topping the list in quantity. Pork and its products also were present in abundance, including a May shipment of 618 live hogs, *Indiana*'s last shipment of this particular commodity. Quantities of bundles of iron (rail) for railroads and private customers also increased this year, and melons and a small amount of fish also went to Buffalo. The year 1856 also saw a unique consignment of forty bundles of fishing poles bound for the upstate New York port.

However, upbound cargoes for Cleveland from Buffalo were very different. Several Cleveland arrivals list no cargo whatsoever aboard the propeller, and two others were as small as 380 packages of merchandise or three tons of merchandise. More than one-third (eight) of the westerly voyages transported sixty tons of cargo or less (usually much less). Nearly half (thirteen) of the year's Cleveland-bound cargoes were varying quantities of undifferentiated "merchandise." Familiar Buffalo consignees included Pratt & Latchworth [*sic*] and Pratt & Co.

Several railroads also were clients that year, including the Central Railroad, the Cleveland, Columbus & Cincinnati Railroad Company, the New York & Erie Railroad, and the Great Western Railway. *Indiana* also transported cargoes for the American Transportation Company and the Western Transportation Company, which had close connections with the railroads.[40] On Perew's account, *Indiana* transported to Buffalo in 1856 a total of 176 barrels of flour, twenty-five barrels of whiskey, eighteen packages of glassware, twelve bundles of pelts, and twenty barrels of apples.

The year 1856 was a relatively slow but steady year for *Indiana* under Captain Perew until the end of September. At that time, he turned over command of his propeller to William H. McNally, who had served as first mate.[41] On his very first voyage, 27 September, McNally ran *Indiana* ashore in a dense fog while in transit from Cleveland to Buffalo. The accident occurred at Point Abino, twenty miles west of Buffalo on the Canadian shore of Erie.

A tug dispatched to the scene lightered off 360 barrels of flour destined for the Central Railroad and then towed the propeller offshore. She arrived at Buffalo that same afternoon. Although newspapers reported no damage at the time of the incident, a claim loss was later entered for $100 damage to the hull and $100 loss on the cargo.[42] Despite this mishap, *Indiana*'s regular schedule continued uninterrupted, and McNally remained as *Indiana*'s captain for the rest of the 1856 season, excepting only one Perew voyage from Cleveland to Buffalo in late October. Her last voyage of the year was to Cleveland arriving 29 November/1 December, and for the first time, she wintered there.

Over the winter of 1856/ 57, Perew once again must have reviewed his financial strategy for *Indiana* and found it wanting, for at the end of March 1857, the following notice appeared in the regional newspapers: "We learn that the propeller *Indiana* has been cleared to run in the New York and Erie Railroad trade to and from Dunkirk the following season."[43]

Dunkirk, New York, forty miles west of Buffalo, had become an important Lake Erie port in 1851 when it became the western terminus of the New York & Erie Railroad. The railroad's maritime branch was the Union Steamboat Company, established in 1854 and the first formal railroad-owned steamship line on the Great Lakes.[44]

Indiana's 1857 season lasted 29 April to 28 November. Aside from single trips to Sandusky at the beginning and near the end of the year, the entire season was spent in round trips between Cleveland and Dunkirk — for the first time in her entire career, there was not a single trip to Buffalo. McNally remained master throughout the year. Recorded cargoes westbound to Cleveland consisted almost entirely of varying quantities of packages of merchandise — anywhere from a low of forty-three to a high of 2,282. On two trips, the merchandise was recorded by weight (forty-one and seventy tons) rather than numbers of packages. The sole exception to merchandise this season was a mid-October voyage to Cleveland with 507 pounds of fish; four trips to Cleveland recorded no cargo at all.

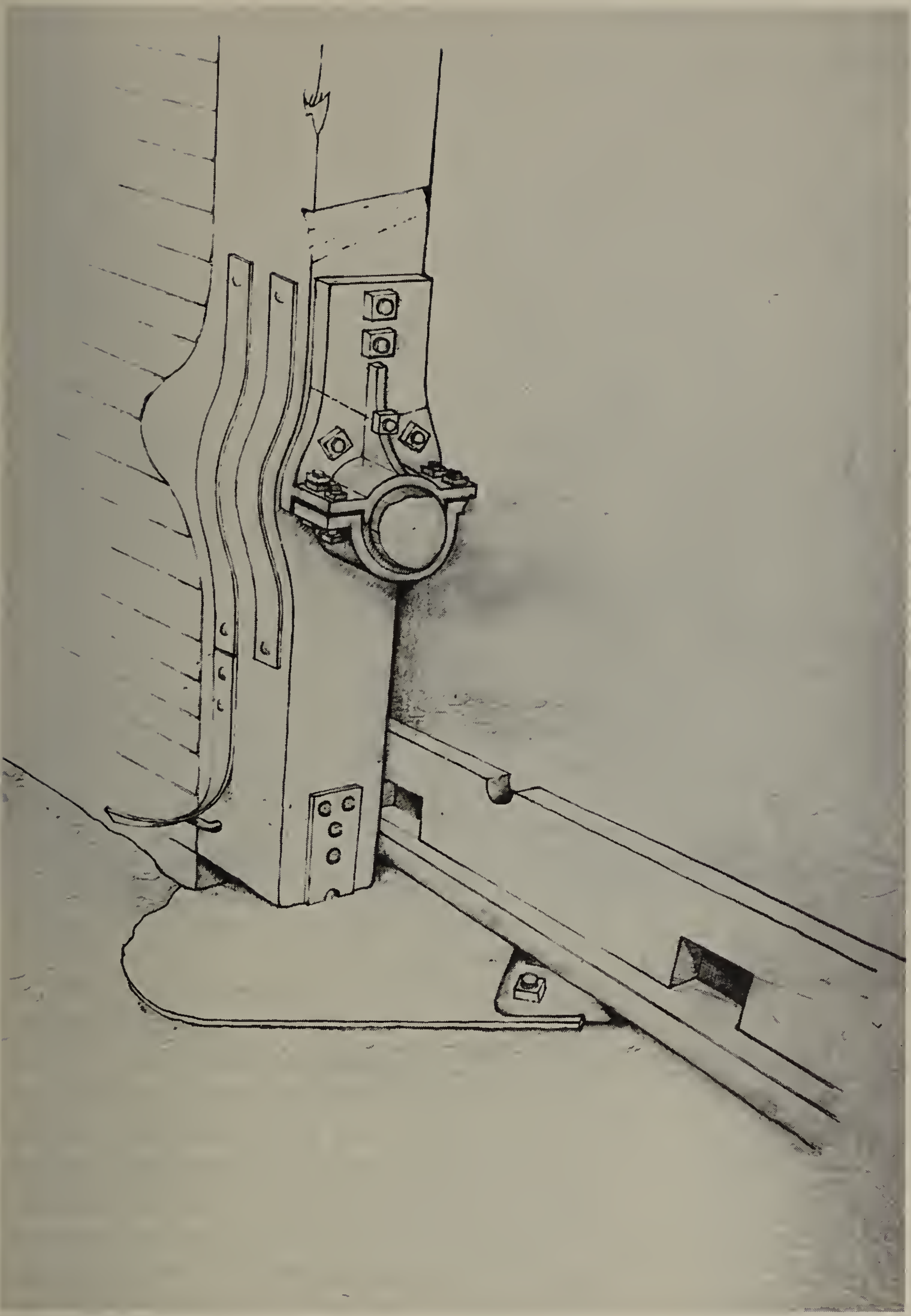
Unfortunately, no eastbound cargoes are known for the season, for no Dunkirk newspapers are preserved for the period, and the Buffalo papers recorded Dunkirk arrivals and clearances only occasionally, without mentioning cargoes. As a result of this paucity of information, it is difficult to analyze the impact of any ambient socio-economic conditions, such as the financial panic of 1857, upon Perew's propeller.

Indiana suffered another casualty during this season. On 16 October 1857, while entering Cleveland, she "hugged the east pier too close [and] got swung upon the west pier inside," in an incident remarkably similar to one of her two 1854 accidents. At risk of being "jammed to pieces," she was rescued by the tug *Peter Smith.* At the time, her diagnosis was "uninjured"; however, later sources indicated a $500 loss.[45]

For the second time, at the end of the 1857 sailing season, *Indiana* wintered at Cleveland rather than Buffalo. Perew himself also may have moved to Cleveland from Buffalo around this period. Although his name does not appear in the directories of either city at this time, he re-enrolled *Indiana* for the last time at Cleveland the following spring on 2 March 1858, naming both himself and the ship "of Cleveland."

During the winter of 1857/58, Perew undertook two major changes for the ship. During the winter lay up, he drydocked *Indiana* at Cleveland for repairs and a refit, after which she was valued at $12,000 or $13,000. Then, shortly before the start of the 1858 sailing season, Perew chartered her for the season to E. C. Bancroft of Detroit for the sum of $6,000.[46] Bancroft, an agent for the Buffalo, New York and Erie Railroad at Detroit, put *Indiana* on the Buffalo–Detroit route, together with the American Transportation Company's propeller *North America.*

Large classified advertisements in the Detroit newspapers now offered unbroken service "receiving and delivering property" to the Buffalo, New York & Erie Railroad terminal at Buffalo and the Detroit & Milwaukee Railroad terminal at Detroit. Ironically, by this time



Stern post of the *Indiana* shipwreck in situ, with deep gouges on the after surface above the stern tube bearing, which is cracked. Below the stern post, the fourth propeller blade is visible. Drawing by Peter Hentschel.

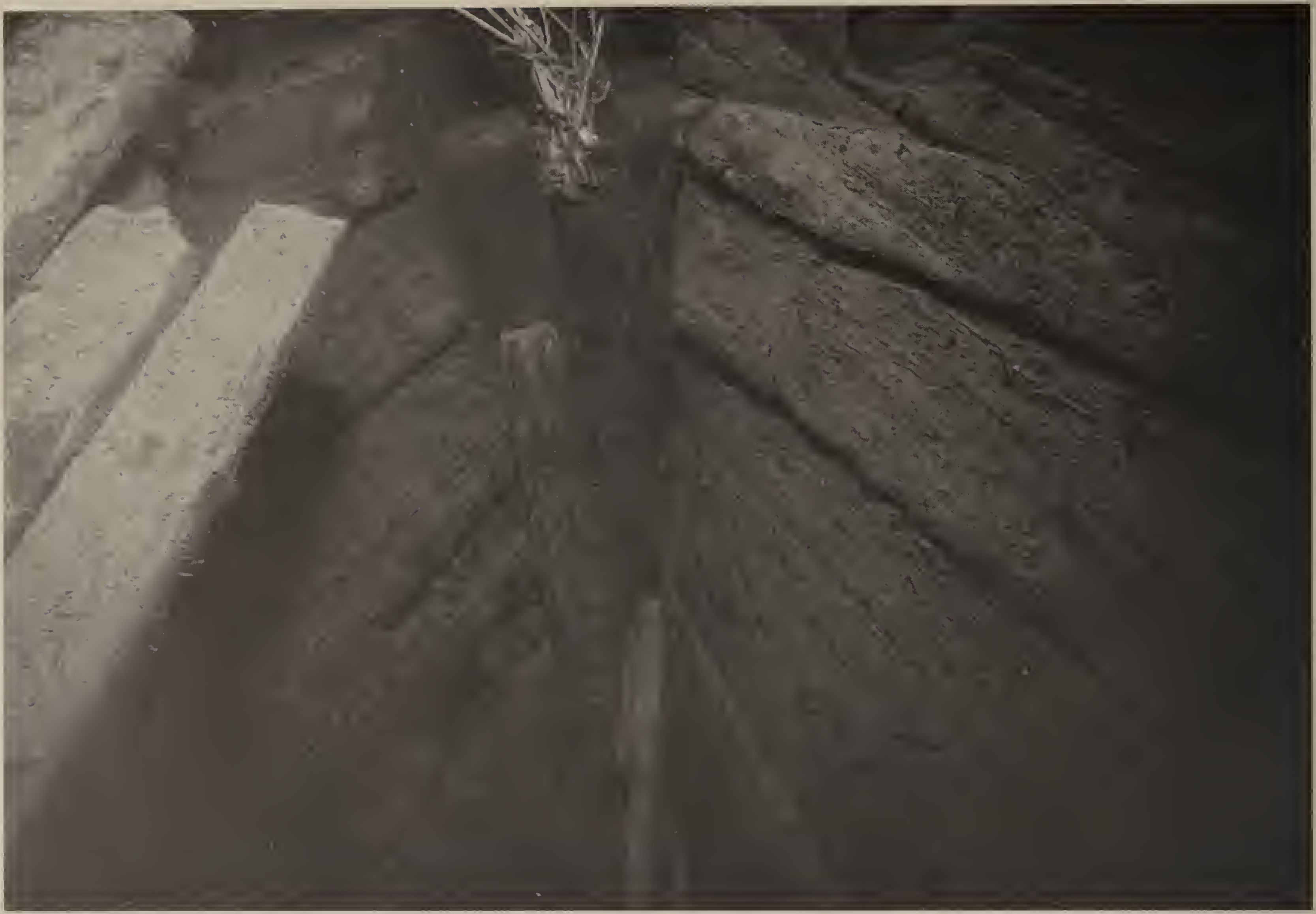
Indiana, *North America* and many other Great Lakes steamers had become little more than bridges between railroad lines, and there is evidence that even those railroads which owned steamship lines were trying to put them out of business.[47]

In contradiction to her published intentions, *Indiana*'s final season began under Captain McNally with a voyage from Cleveland to Buffalo in early May 1858. Thereafter, the rest of the month was spent between Detroit and Buffalo. The Buffalo papers recorded only one arriving cargo, consisting of 2,500 bushels of wheat, 150 bags of potatoes, fifteen barrels of beans and 480 barrels of flour for four consignees, two of which were railroads.

This arrangement must have proven unsatisfactory to one or more parties, for there was a newspaper announcement that *Indiana* had joined five other "staunch propellers" in the People's Line running between Buffalo and Lake Michigan ports. Perew's propeller was temporarily excluded from this schedule due to a short-term charter for the transport of iron ore from Marquette, Michigan in Lake Superior down to Cleveland for the Cleveland Iron Mining Company, but Detroit newspaper readers were assured that she would "resume her place in the line as soon as her present engagement is finished."[48]

On 29 May 1858, *Indiana* suffered her first and only human casualty when an unnamed hand was "seized with a fit" while preparing to heave a line from ship to shore at a Detroit dock. He fell overboard and drowned before he could be rescued.[49]

The incident seems to have had little impact on the propeller's operations, for she was seen shortly afterwards on her first Lake Superior trip arriving at Marquette by the propeller *Northern Light*, which was clearing that port with a cargo



Indiana's stern post from inside the hull (looking aft), illustrating the massive vertical split and verifying the contemporary descriptions of the events leading to her loss. Photo by the author.

of 170 tons of copper for Detroit. Reportedly, *Indiana* towed the 147-ton schooner *J. W. Sargent* (1855) "through the Canal" (St. Mary's Falls Ship Canal at the Sault) on her upbound trip — her second recorded instance of this activity. She loaded 280 tons of iron ore and cleared Marquette for Cleveland early on the morning of Sunday, 6 June 1858. On board were a total of twenty-one individuals, including owner Frank Perew, Captain William McNally, first Engineer John Perew of Cleveland, fifteen unnamed crew,[50] and passengers L. C. Tibbats of Cleveland, S. Gales of Silver Creek, New York, and Samuel Burt of Marquette. Aside from an occasional trip with the owner aboard, this was *Indiana*'s only recorded instance of transporting passengers.

Contemporary newspaper accounts indicate that all went well until 7:00 or 8:00 PM, when *Indiana* was twenty to forty miles off Whitefish Point, Michigan, eight to ten miles offshore.[51] At that time, her propeller stuffing box was reported to have broken, splitting the stern post. One source attributes the incident to a steam pipe [52] bursting almost simultaneously with the stern post splitting. In either event, "the engines [*sic*] began to work badly," and the crew attempted to lighten the stern to "improve her action" and presumably raise and inspect the source of the problem. However, the water rose too rapidly, and the ship settled to her guards in around fifteen minutes, putting out her boiler fire.

At that point, those aboard were told to abandon ship in two small boats with nothing more than their clothes. However, one of the boats was damaged by swinging against the propeller screw while being lowered. Despite this, the crew attempted to tow *Indiana* toward shore, but with one boat filling rapidly, they were forced to give up the tow around 10:00 PM and head for the nearby shore. *Indiana*'s lights were seen "for a long time after they left the vicinity" before she was presumed to have sunk in forty to sixty fathoms.

All twenty-one reached the shore without injury or loss of life in about two hours. They camped out overnight, rigged up a sail from a piece of cloth the next morning, and sailed in their craft to Whitefish Point, which they reached Tuesday evening. On Wednesday, they were picked up at the Point by a schooner downbound from Marquette (variously named *Ellington*, *St. Paul*, or *St. James*) and taken to the Sault, whence the propeller *Iron City* took them on Thursday the remaining distance to Cleveland. A day or two after the loss, the schooner *St. Paul* and propeller *Mineral Rock* were in the vicinity of the wreck and reported seeing large portions of the wreck afloat, including a 50-foot section of the deck house, indicating to them that *Indiana*'s upper works had floated off while the ship was sinking.

Although the newspaper accounts valued *Indiana* at figures ranging from $12,000 to $20,000, the ship herself was insured for only $9,000; of this amount, $2,300 was placed with the Northwestern, and the remainder with the Mercantile of New York and the Toledo Mutual. The ore cargo was separately insured for an undisclosed amount, and one of the contemporary newspapers stated that it was the "first cargo of Lake Superior iron ore ever lost on the lakes."[53] *Indiana*'s last enrollment was surrendered at Cleveland on 16 October 1858, and she was not seen again in the contemporary record.

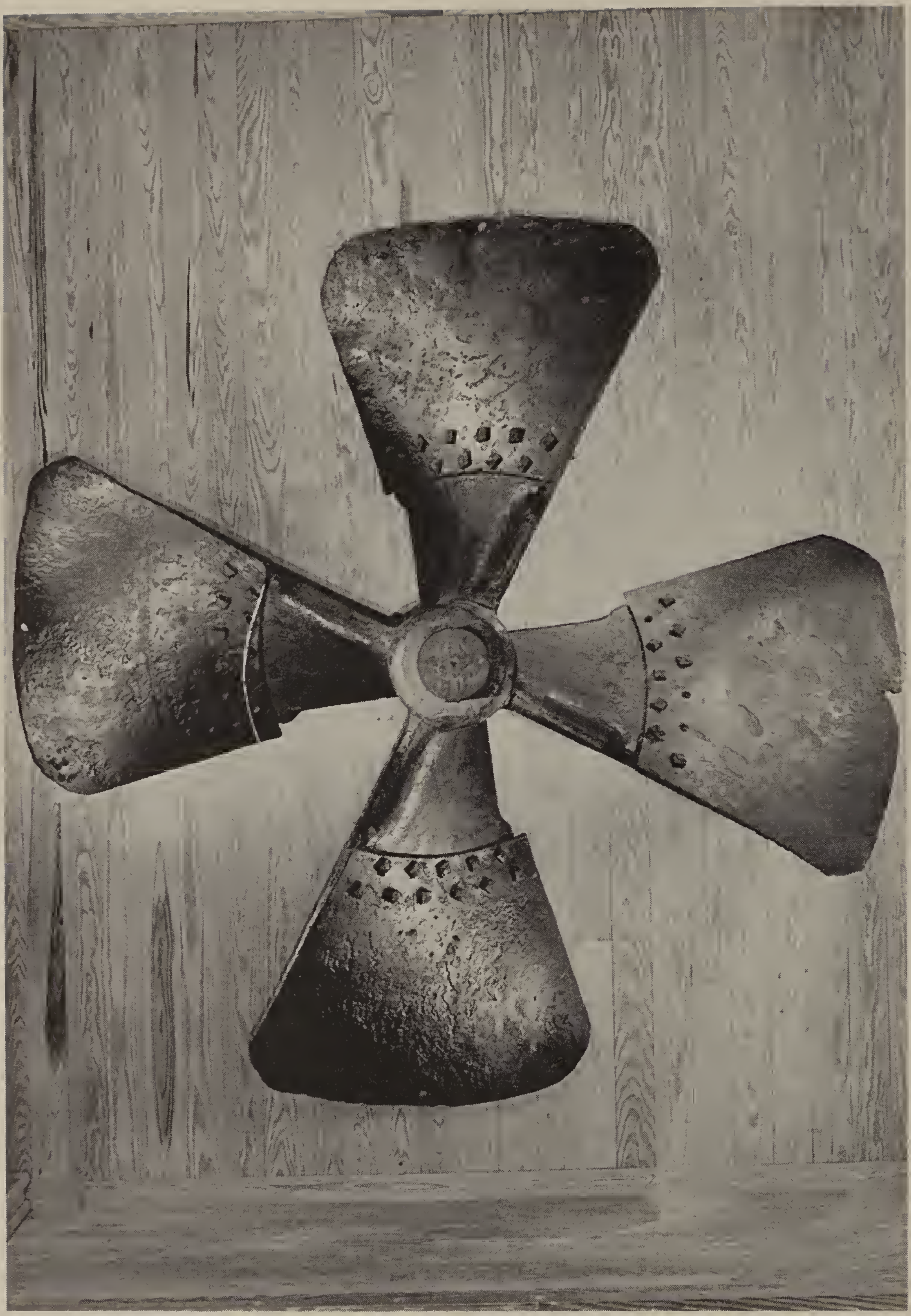
Despite their divestiture of *Indiana* in 1852, Alva Bradley and Ahira Cobb remained extremely active in the shipping business throughout their later careers. In 1849, Bradley and Isaac Nicholas purchased Burton Goodsell's shipyard at Vermilion and turned out a number of vessels there.[54]

In 1851, Bradley married Helen M. Burgess of Milan, Ohio. Together, they had three daughters and one son. In 1859, the partners moved to Cleveland. There they expanded their shipping interests even further, building eighteen ships on their own account for the Bradley Transportation Company from 1861 into the 1880s and using their growing fleet both for general shipping as well as more specialized ore transport from the upper Lakes. Under Bradley's ownership, five or six vessels were lost over the years, and the Bradley fleet was self-insured.[55] Around 1867, the two partners added Philip Minch and Isaac Nicholas of Vermilion to their firm, which began building steamships and propellers at Cleveland.

Bradley's third child and only son, Morris A. Bradley, joined his father's company in 1868 and eventually became its manager; he fostered its incorporation in the 1880s with $350,000 capital stock for shareholders. In 1880, Captain Bradley became a founding member and the first president of the Cleveland Vessel Owners Association. The same year, he was an incorporator of the Case Institute of Technology. He built a large mansion on exclusive Euclid Avenue ("Millionaire's Row") in Cleveland, where he lived until his death in 1885. His personal fortune was estimated at $10 million, mainly in real estate.[56]

Ahira Cobb's career subsequent to his part ownership and management of the propeller *Indiana* roughly paralleled Bradley's. The two men remained partners throughout their professional careers, but Cobb maintained some separate business interests as well. Married in 1839 to Maria Bryant of Birmingham, Ohio, the Cobb family eventually expanded to include nine children.

With the 1859 move to Cleveland, Cobb purchased a lot on which stood a tavern and stables, gradually buying up the rest of the block with Bradley's help. He obtained an interest in Crowell & Childs, a Cleveland footwear company, and also invested in the development of blast furnaces at Youngstown and Antwerp, Ohio. In 1869, he became a founding board member of the Ohio National Bank. In 1874, he erected a large building, one half of which housed Strong, Cobb & Co., drug importers and wholesalers, in which he had earlier invested. Eventually, he gave his interest in this firm to



Indiana's propeller, measuring 9' 7.75" (outside diameter), is on display in the Hall of American Maritime Enterprise at the National Museum of American History. The left blade is reconstructed outboard of the line drawn on it. The original was discovered on the wreck site in 1993, lodged beneath the stern post. Photograph by Eric Long.

his eldest son, Lester Ahira Cobb, and his younger son Ralph also became a partner. Initially moving from Vermilion to a modest home at the corner of Prospect and Perry Streets in Cleveland, he later built an elegant mansion on the most exclusive Euclid Avenue.

Cobb predeceased his partner Alva Bradley by three years, dying of a liver ailment in 1882. Despite this end to their earthly alliance, the two men were reunited in the hereafter — they were buried in neighboring plots in Section 11 of the Lakeview Cemetery in Cleveland, where their large funeral monuments can be viewed today.[57]

For *Indiana*'s last owner Frank Perew as well, the propeller marked only the early stage of an illustrious career in Great Lakes shipping. His stint as *Indiana*'s master until September 1856 marked the end of his active duty on the Lakes; thereafter he managed his shipping interests from the shore. However, exactly which shore he occupied is uncertain, for he did not appear in the city directories of either Buffalo or Cleveland from the late 1830s until 1862. If he indeed moved to Cleveland around the winter of 1857/58, he may have resided in a hotel, suburb or outlying town. In 1862, he appeared in the Buffalo city directory as a captain, boarding at 25 Carolina Street. He was listed under two other nearby addresses on the same street until 1869, when he moved to 136 West Tupper and listed himself as "vessel owner."

After *Indiana*, Perew held only full ownership of vessels, without partners. Aside from the vessels mentioned above, over his career he also owned the propellers *Cataract* (1852), *T. U. Bradbury* (1855), *John B. Lyon* (1881), and *Alfred P. Wright* (1888); barks *Oliver Lee*

(1845), *Mary Elizabeth Perew* (1861), *D. P. Dobbins* (1863), *Chandler J. Wells* (1886), and *John M. Hutchinson* (1875); tug *William G. Fargo* (1862), and barkentine (or bark) *Joseph G. Masten* (1867).

On 17 July 1867, Perew married Alice R. Currier of Buffalo. Their three children died in infancy or early childhood, but four children from his first marriage to Mary E. Wooley of Cleveland survived. From 1870 to 1879, the Perews lived in Buffalo at various Franklin Street addresses; in the latter year, Perew added marine insurance to his directory listing for a single year. For the next ten years, the Perews occupied 529 Franklin Street, after which they purchased a large home at 4 Vermont Street. Some secondary sources indicate that Perew retired from his business activities in 1892, but he retained his directory listing as vessel owner until 1895, with an office at 7 West Seneca. He apparently suffered from locomotor ataxia (progressive muscular and coordination loss) for the last decade of his life, which ended suddenly on 4 July 1898. His last will and testament listed among his assets a farm in Ashtabula County, Ohio, as well as a house and lot in Cleveland. His Buffalo home on Vermont Street, which he willed to his wife, was sold soon after his death. The house was so large that it became the Rose Mary Smith Infant's Home. Sometime around the early 1940s it became the Working Boys' Home.[58]

A measure of the respect accorded Captain Perew during his lifetime is the three vessels named after him, all built in 1867: a 174-foot coal schooner, a 70-ton Canadian tug, and a 524-ton bark. Oddly, two of them sank: the eponymous bark foundered near South Fox Island in 1873 and the collier sank in 1892 off Whitefish Point, not far from *Indiana*'s wreck site. She is being sought at the time of this writing.[59] Perew's nephew and namesake followed in his uncle's footsteps, serving on his uncle's and others' vessels in a variety of positions from cabin boy to chief engineer in the 1870s.

The wreck of *Indiana* lay on the bottom of Lake Superior for 114 years, known only to the local marine life and occasional fishermen who snagged their nets on it. In 1975, the wreck was discovered and identified by John Steele of Waukegan, Illinois, who showed film footage of the site to C. Patrick Labadie of the US Army Corps of Engineers at Duluth and Dr. Richard J. Wright of Bowling Green State University. They in turn subsequently contacted John Stine of the Division of Transportation at the Smithsonian Institution's National Museum of American History.

In 1978, the *Indiana* wreck site was declared eligible for the National Register of Historic Places on account of her pioneering machinery, which predated the earliest known Great Lakes marine steam machinery by forty years. Over the following winter, Stine gathered an interdisciplinary team of specialists from the Smithsonian, US Navy, US Coast Guard, US Army Corps of Engineers, Bowling Green State University, and the History Division, Michigan Department of State, for the purpose of raising the propulsion plant and related machinery.

In late July and early August 1979, a ten-day salvage operation successfully raised *Indiana*'s engine, boiler, propeller, rudder, steering quadrant and related machinery. In 1980, the crankshaft was recovered, and the ship's safe also was located, raised, and opened. In it were found a small medicine bottle, a coin, and a small clasp, possibly from an account book. Additional materials recovered by the Smithsonian from *Indiana* include the propeller hanger bearing, steam whistle, crankshaft, two feedwater pumps, feedwater preheater, shaft bedplate and cap, engine and fire box tools (wrench, sledge, rake, tongs, shovels, poker, turning/scaling bar), anchor, bilge pump, hand bell, iron ore cargo, and boiler firewood. All these materials were transported to the National Museum of American History (NMAH) in Washington, DC for conservation, study and display.[60] In addition, recording and filming of the site continued, and the fantail section was located.

In subsequent years, underwater documentation continued, conservation of recovered machinery was undertaken, and a capstan and anchor from *Indiana* at the Museum Ship Valley Camp in Sault Sainte Marie were transferred to Washington, DC.

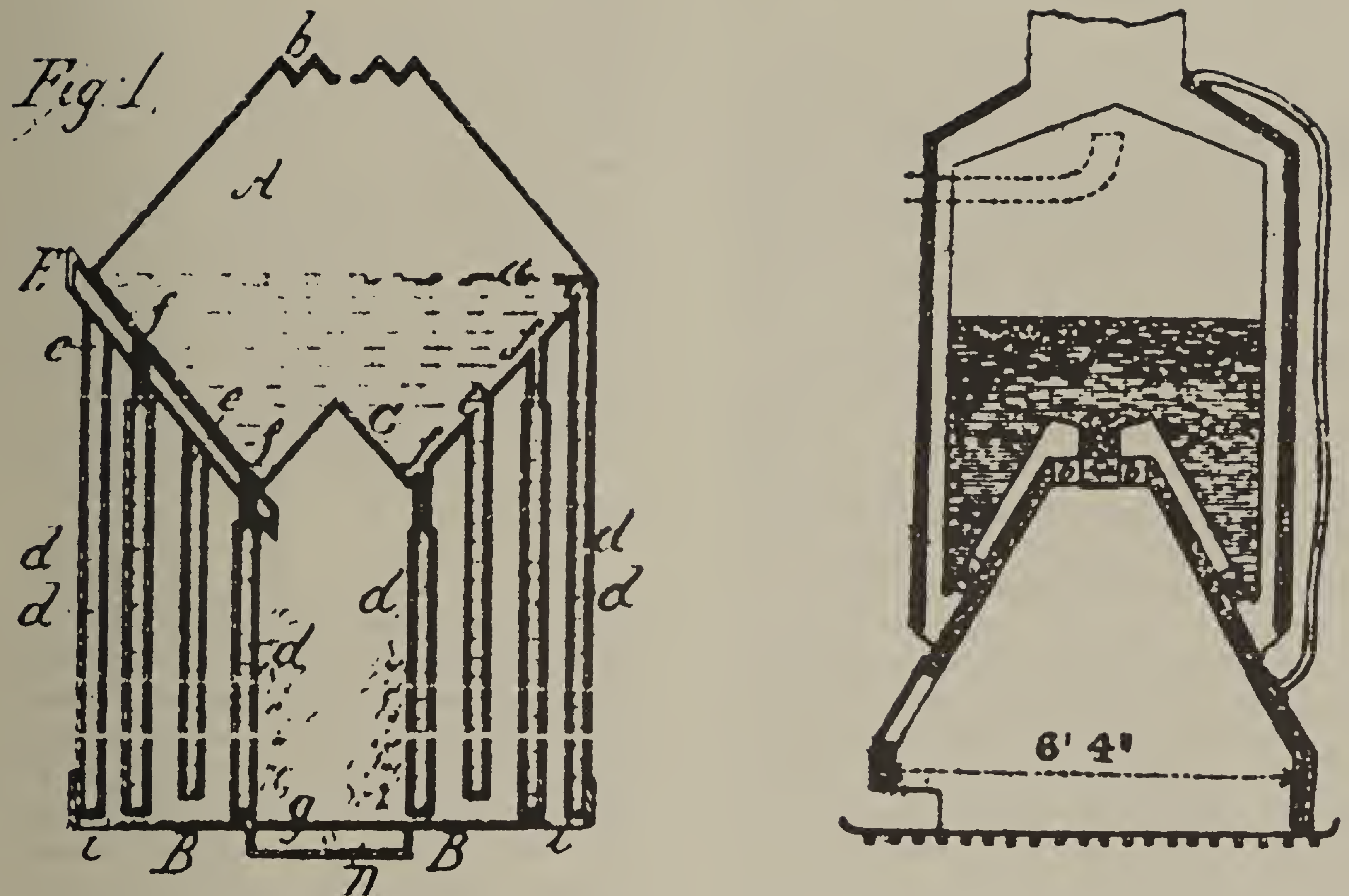
In 1989, Smithsonian researchers undertook additional reconnaissance dives to ascertain the state of preservation and feasibility of further documentation of *Indiana*; these dives indicated that additional documentation was necessary for proper publication of the vessel. During the 1991–93 campaigns that followed, a total bottom time of 104.75 hours over 211 compressed-air dives was logged. Diagnostic samples of the hull timbers were recovered for analysis at the Forest Products Laboratory in Madison, Wisconsin and the Smithsonian Institution's Conservation and Analytical Laboratory. Elements of the vessel are currently on display in the NMAH's Hall of American Maritime Enterprise; other portions are in offsite museum storage at Silver Hill, Maryland, and Lansing, Michigan. Additional artifacts have been removed by other parties over the years as well, and efforts are underway to recover these items and unite them with the rest of the *Indiana* assemblage at the NMAH.

In broad terms, the archaeological evidence gathered from the wreck of *Indiana* during the 1979–1993 diving campaigns confirms the historical accounts and amplifies them to a considerable degree. However, in some areas the evidence directly contradicts the historical record and offers new insights into the vessel's history that were otherwise undocumented. In other instances, it raises new questions that remain unanswered.

Indiana's final resting place is located fifteen miles due west of Whitefish Point, 3.6 miles off Crisp Point Lighthouse in Luce County, Michigan, at a depth of 120 feet. If contemporary accounts of her wrecking location were accurate, she must have drifted in a southeasterly direction for several miles after abandonment but prior to sinking. It seems highly unlikely that two small boats, one of which was leaking, could have towed a 349-ton propeller laden with 280 tons of rocks any appreciable distance. *Indiana*'s engine controls were found shut off, and the boiler grate was packed with lightly charred firewood, indicating that her boiler had been stoked just prior to the accident. The heavy timber legs supporting the engine, painted green from the level of the main deck up to the cast iron top, also are slightly charred for the bottom eight feet, indicating an undocumented fire at some point in *Indiana*'s career.

The wreck lays upright on the lake bed, preserved to the deck level with the after half essentially intact, confirming the contemporary accounts that some of the upperworks floated off as the boat went down. Long sections of lightly built upperworks lay on the lake bed beside the hull, where they fell off presumably as their fastenings corroded; their external surfaces are face down in the sand and could not be recorded. Extending above the deck level to a height of 5' 9.5", their light construction indicates that they bore only a framework or canopy above, not another deck. Any heavier structures such as a pilot- or deckhouse must have been very lightly attached, for no evidence was found for fastening them onto the deck; however, any such fastenings may be obscured by the considerable quantity of iron ore stowed on deck. Otherwise undocumented in the contemporary record, this ore may have rendered the vessel top heavy and possibly unstable.[61]

A section of the fantail, complete with bulwarks, a canopy stanchion, and large towing cleat, is located 100 feet away from the hull. At the stern, the stern tube bearing, in which the propeller shaft turned, is cracked horizontally; while this generally matches the historical description of the accident, it was not possible to check the condition of the stuffing box, for it is buried in the stern post and deadwood and is therefore inaccessible. However, the propeller shaft is tight within the external bearing surfaces, and there is no evidence that *Indiana* could have taken on enough water through this joint to warrant abandonment.[62] Above the exterior bearing, the after surface of the stern post has two deep diagonal gouges, possibly indicating that when the propeller went out of true, one of the



Both Burnell's 1834 boiler (left) and Parmalee's 1847 "bee-hive" boiler (right) bear close resemblances to *Indiana*'s machinery. From Burnell's original patent application of 21 May 1834 and T. D. Stetson, "The Bee-Hive Boiler of Lake Erie," *Journal of the Franklin Institute*, 27 (1854), 356, respectively.

blades struck the post a powerful blow or two.

From inside and above the stern post, a massive vertical split in this timber is evident, also matching the historical account, perhaps occurring when the propeller blade struck it. The exterior hull planking also is started from the stern post, although this could have happened gradually after the wrecking event as the hull fastenings deteriorated, or even when *Indiana* struck bottom.

The propeller was found snapped off the shaft and lying on the lake bed adjacent to the hull; one of the blades had broken off and was lodged beneath the base of the stern post, buried in the sand. This must have occurred when the stern settled on the bottom. There is no visible evidence for the burst steam (or stern) pipe referenced by one of the contemporary accounts.

Analysis of thirty-five wood samples recovered from structural members throughout the vessel indicates that *Indiana* was constructed almost entirely of white oak. Indigenous to the Vermilion area where she was built, oak in various forms was one of the principal town exports in the mid-nineteenth century. The two exceptions were the decking and bulwarks sheathing, which were white pine. Samples of the caulking between hull strakes revealed a matrix of a putty containing white lead and sulphur, with small amounts of calcium (chalk or lime), silicon (sand), and iron. Unexpectedly, examination indicates virtually no oakum or other fiber content in the caulking. While this would have been exceedingly unusual in a saltwater ship, it is not known whether this was the rule or an exception in the Great Lakes, for there are no comparanda for *Indiana* in this detail at present.

In some instances, the archaeological evidence only points to new questions rather than answers. Despite considerable research over the past fifteen years, the source of *Indiana*'s unique engine and boiler remains a mystery. Uncommonly, there are no identifying makers' marks or builder's plates associated with these members. The first and likeliest candidates, manufacturers in the nearest towns to Vermilion on Lake Erie capable of producing the machinery, were investigated most thoroughly. To the east in Cleveland, the likeliest candidate was the Cuyahoga Steam Furnace Company, which produced its first marine steam engine in 1843 for the propeller *Emigrant*. However, a thorough search of the extant company papers yielded no information regarding *Indiana* or her owners, and a Cleveland newspaper article of 28 March 1848 detailing a tour of the factory mentions five unrelated marine steam plants under construction.[63]

Two other possibilities may be identified for local origins of *Indiana*'s machinery. The earlier is Levi Burnell of Elyria, Ohio, a few miles to the west of Cleveland on the Black River. On 21 May 1834, Burnell patented a boiler "in the form of a vertical cylinder, terminating at top in a cone (sic)."[64] Although no known examples of Burnell's water tube boiler have been identified to date, its external beehive resemblance to *Indiana*'s boiler is unmistakable, and it is possible that Burnell's design evolved into the *Indiana* machinery fourteen years later.

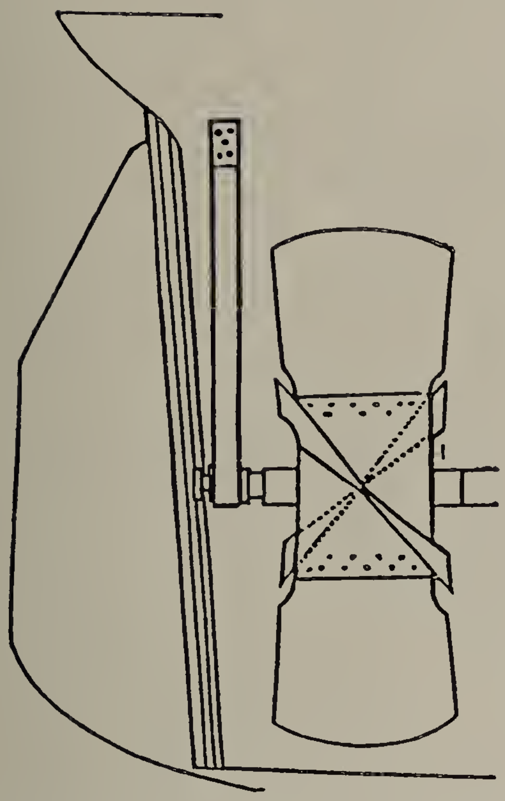
The later candidate is Luman Parmalee, a Cleveland steam engine builder. Parmalee first appears in the Cleveland area in 1846 as a steam engine builder at the Cleveland City Furnace, sometime after an apprenticeship at the West Point Iron Works in New York. Although not listed in the 1848/49 Cleveland directories, during that period he was part owner of the propeller *Troy* (1849), whose engine was built by the Cuyahoga Steam Furnace Company and whose boiler he himself had supplied. In the late 1840s, Parmalee also designed, but never patented, a "bee-hive" boiler which bears an even closer resemblance to *Indiana*'s boiler than Burnell's. Its first application was in the 1847 Cleveland propeller *Boston*. In 1851, he was listed as co-owner with J. McClelland of the Phoenix (alt. Phenix) Foundry in Cleveland. By 1854, the company was offering six different sizes of propellers and "twenty other different engine patterns...capstans, windlesses, hoisting wenches [sic], and all other castings for steam and sail craft." By 1854, at least twelve more propellers had received his boilers, and all reports of their performance at the time were favorable.[65] However, *Indiana* is not among the ten named vessels of the thirteen beehive boilered propellers.

To the west in Sandusky, where *Indiana* was first enrolled, no records exist for the foundries capable of building appropriate machinery at the time, and there is evidence that some Sandusky built steamboats of the period were engined as far away as Buffalo.[66] Similarly, in Erie, Pennsylvania, there were two foundries producing steam plants: Vincent, Himrod & Co. (predecessors of the Erie City Iron Works) and Sennet & Co. However, neither specifically mentions marine steam engines in their commercial directory advertisements, and few (if any) Great Lakes steamboats of the period whose sources of machinery are known are found with Erie built power plants.[67] A similar paucity of evidence holds for foundries operating in the late 1840s in Buffalo and New York City. Names and grandiose foundry advertisements abound in these cities' commercial directories for the period, but no archival or manuscript evidence has surfaced to date to link any of them with *Indiana*, with one post-construction exception.

On 11 July 1857, the directors of the Buffalo Steam Engine Works of Buffalo filed a 40-page petition in the Erie County Supreme Court in Buffalo to dissolve the firm. The handwritten document lists all of the company assets, and one of these assets is an unpaid bill of $53.81 owed by the "Prop. Indiana." Probably a bill for

LOPER'S PROPELLER.

Fig. 77.



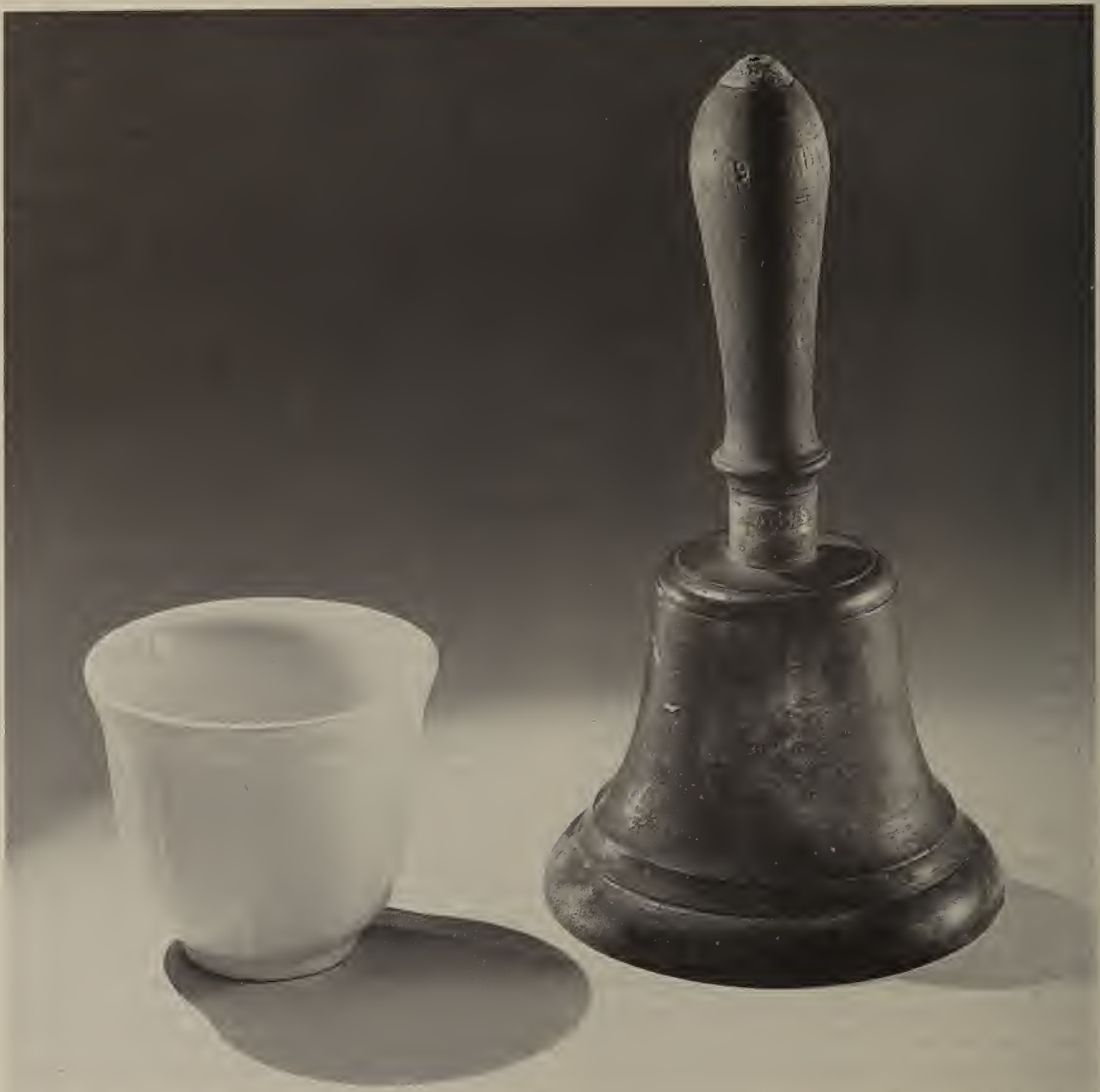
Macfarlane's 1851 drawing of a Loper propeller illustrates several similarities with *Indiana*'s wheel. From R. Macfarlane, *History of Propellers and Steam Navigation* (New York: George P. Putnam, 1851).

repairs, it is interesting to speculate whether *Indiana*'s last owner Frank Perew ever paid this bill, considering the status of the company.[68]

Managing owner Ahira Cobb's personal ledger offers other potential clues to the source of *Indiana*'s machinery.[69] A series of four entries in June and early July 1849, a year after *Indiana* was enrolled, record payments totaling $7,000 to the Union Manufacturing Co. The Cuyahoga Steam Furnace Company records indicate that this was around the proper amount for a steamboat engine, and their contracts further reveal that payments for steamboat machinery could be extended over as much as 2½ years after the contract date. Another Cobb ledger entry for 18 July 1849 lists a $500 payment to McClelland & Baker for a "Proppeller Engine," and another $15 payment the same day to the same company for a mill engine.[70] Either of these two sets of payments could have been for *Indiana*'s machinery — however, in the absence of documentation for these and the other firms outlined above, anything more than speculation is not possible.

One other potential machinery source was investigated. *Indiana*'s four-blade propeller was manufactured by Spang & Co., as indicated by a preserved stamp on one of the blades: SPANG & CO/PITTSBURGH/O[ ]H. This firm, a large iron manufacturing company based in Pittsburgh, Pennsylvania, was founded in 1828 and was one of the earliest and largest manufacturers of iron products in the United States. It used the name "Spang & Co." from 1845 to 1858, when its owners retired and the name was changed to Spang, Chalfant & Co. Preserved company records do not record either the propeller or other machinery transactions from Vermilion, although the firm had a branch in Cleveland that undoubtedly supplied *Indiana*'s propeller.[71]

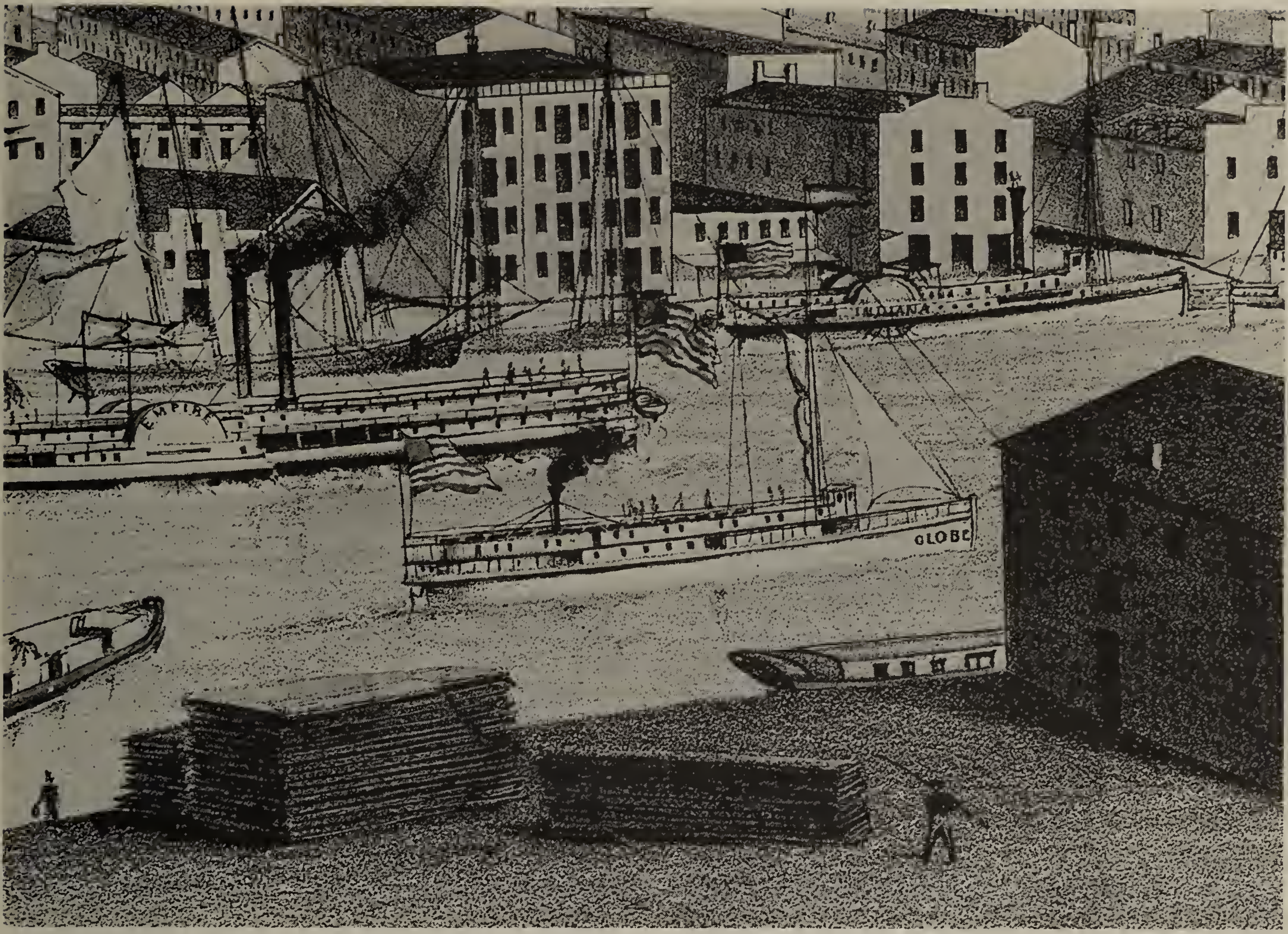
Although the propeller's manufacturer is known, its designer is less certain. The likeliest candidate is Richard F. Loper (1802–1880) of Philadelphia, who obtained three propeller-related patents in 1844/45. His design was so practical that by 1851, it was said that "its good character is so well established, that it requires no further eulogy than to say, that more of these kind of propellers are now employed on vessels in the United States than any other, and on vessels of every class of burden..."[72] Unfortunately, it was so commonplace that it was never clearly described, and Loper's patent drawings bear only a superficial resemblance to *Indiana*'s propeller. However, clues scattered among contemporary sources, including a lawsuit by a rival designer, indicate that its chief characteristics were total submergence in the water, four blades, and blades twisting into the hub.[73] *Indiana*'s wheel exhibits all these characteristics, and also shares several others with an 1851 drawing of a Loper propeller, including an identical suspension arrangement, blades riveted to the hub, and double rows of rivets.[74] Loper licensed his propeller design to Reaney, Neafie & Co. of Philadelphia, which marketed it so successfully and widely that it became known as the "Philadelphia Wheel."



Since *Indiana*'s upperworks, including deckhouse(s), floated off as she sank, there is very little evidence of daily life aboard the early propeller. Two exceptions are this hand bell and cup from the wreck site. Smithsonian photograph by Eric Long.

In the absence of much evidence, it is difficult to offer any substantive insight into daily life aboard *Indiana*. Aside from the hand tools, items found on the wreck that might have seen personal use are a hand bell, a small tea or coffee cup, and the safe, which contained a small coin, a clasp, and a small medicine bottle. Without a recorded provenance, it is impossible to ascertain whether the bell might have been used as a dinner, fog, or watch bell, or a combination of these functions. The safe was found nearly buried in the sand on *Indiana*'s port side, and must have fallen out on her final downbound voyage to Superior's lake bed.

Provenance was not recorded for the other items. In addition, a blue and white jug marked on its base with a Milwaukee maker's mark, a lantern fragment, and a butter-sized plate are



In the absence of a contemporary image of *Indiana*, the closest analogue is the twin-screw propeller *Globe*, built in 1846 by David R. Stebbins at Maumee, Ohio. The earlier sidewheeler *Indiana* is pictured in the background of this image. Detail of the print *Buffalo in 1846*, courtesy of the Mariners Museum, Newport News, Virginia.

also reported to have been recovered from the wreck site before legislative restrictions on artifact recovery went into effect, but these reports have not been verifiable to date. Little is known about the crew and their respective duties and activities beyond the positions of a few officers and the overall crew size.

While there are plenty of contemporary images of propellers and steamships, most of them are lithographs, wherein the accuracy of depiction is subject to interpretation and the amount of detail highly variable. There are comparatively few photographs of Great Lakes shipping from the period, and none of *Indiana*. By the time photography became popular in the region in the 1870s, most of *Indiana*'s generation of boats were gone or cut down into barges. As a result, a detailed reconstruction is currently underway based upon the archaeological evidence, information from contemporary images of similar vessels and informed guesswork to fill in the unknown areas. Current research indicates that the earliest boat depicted in contemporary graphic art most closely matching *Indiana* in date, size, and general dimensions is the twin-screw propeller *Globe*, built in 1946 by David R. Stebbins at Maumee, Ohio.

Measuring 143' 11" x 24' x 9' 7" and 313-34/95 tons, *Globe* lacked the deck overhang and other, minor features documented on *Indiana*, but is otherwise similar in overall detail. The propeller *Ogontz*, built in 1848 at Ohio City, Ohio, and measuring 152' 7" (length of keel) and 343-37/95 tons, was even closer to *Indiana* but remains undocumented in the pictorial record; a detailed description is contained in *The Com-*

mercial Advertiser and Journal (Buffalo) for 11 May 1848.

As late as 1841, only one propeller, *Vandalia*, had been built on the Great Lakes. By the end of 1847, this number had increased to thirty.[75] By the end of the following year, fourteen or fifteen had been added to the fleet, and by the end of the 1850s, propellers dominated the regional shipping, as a glance at the shipping columns of the regional newspapers demonstrates. This strong increase in propeller numbers in the Great Lakes, which was not reflected along the East Coast, is attributed to a variety of reasons, including a growing grain trade requiring higher numbers of freighters, lower operating costs, greater cargo space and better-protected propulsion than paddle steamers.[76] In addition, the area's readily available fresh water for boilers and fuel supply (both wood and coal) — unparalleled on the East Coast — also fostered growth in the technology and its application, as did a burgeoning population with growing needs.

Between 1848 and 1858, steam gradually began overtaking sail in the Great Lakes, and only a few short years later the steamship was dominated, if not completely replaced, by the railroad. Over her decade-long career, *Indiana* partook in this gradual supersession of sailing craft by steam powered shipping. She also contributed to the obsolescence of her own kind by transporting railroad goods and equipment throughout the Lakes, thereby helping to foster the railroad's regional growth and steamboat's gradual replacement for all but the slowest bulk cargoes. Never advertised as fast, splendid, upper cabin, new, swift, staunch, or any of the other descriptives commonly applied at the time to her fellow boats, nevertheless, *Indiana* contributed materially to the Great Lakes' growth and development, capably and uneventfully transporting thousands of tons of freight behind the scenes for the benefit of hundreds of individuals. It is precisely this function, representative of many dozens of similar vessels during this seminal period in the region's history, that makes her unique today.

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Notes

1. For Vermilion history, see T. A. Smith, *Oulanie Thepy: The Golden Age of Harbour Town Vermilion 1837 to 1879* (Vermilion, OH: Northwest Ohio–Great Lakes Research Center, 1973); T. A. Smith,"The Firelands and the Settlement of Vermilion," *Western Reserve Magazine* (1980) 37–44; S. L. Barry, "Shipbuilding in Vermilion," *Inland Seas* 49.3 (1993) 191–198. The Great Lakes Historical Society in Vermilion has numerous subject files on various aspects of Vermilion's past. The town did not have its own newspaper until 1876. I am grateful to Jay C. Martin, David J. Cooper, and particularly C. Patrick Labadie for their advice and close critical readings of this manuscript.
2. The contract for *South America* is preserved in Mrs. G. Rideout, *Ancestors and Descendants of Morris A. Bradley* (Cleveland: Private Print, 1948), n.p. Cobb and Bradley took Rodney Andrews, a neighbor of Bradley's in Brownhelm, Ohio as a third partner in *South America*.
3. Anonymous, "At Lake View Cemetery. The

Remains of Captain Bradley Taken to Their Long Rest," *Cleveland Leader*, 3 December 1888; W.R. Coates, *A History of Cuyahoga County and the City of Cleveland* (Cleveland: The American Historical Society, 1924), II, 312–313; W. Havighurst, *The Long Ships Passing* (New York: MacMillan Publishing Company, 1975), 333–335; E. M. Avery, *A History of Cleveland and Its Environs. The Heart of New Connecticut* (Chicago: Lewis Publishing Company, 1918), 426–428; C. Johnson, compiler, *History of Cuyahoga County, Ohio* (Cleveland: D. W. Ensign, 1879), 333–334; Editors, *Biographical Cyclopædia and Portrait Gallery* (Cincinnati: Western Biographical Publishing, 1884); personal papers of Carl B. Cobb of Aurora, IL.

4. Bradley's early history: Havighurst, *ibid.*, 333; Anonymous, *ibid.*, col 2. Edison tale: Anonymous, "Edison Could Have Been a Vermilionite," *Vermilion News*, 18 February 1954: 5; M. V. Melosi, *Thomas A. Edison and the Modernization of America* (New York: HarperCollins Publishers, 1990), 5–6. According to D. D. Van Tassel and J. J. Grabowski, eds., *Encyclopedia of Cleveland History* (Cleveland: Case Western Reserve, 1987), 119, at one point, Captain Bradley lived in the Edison home.
5. *Alvin Clark*: D. T. Bowen, "The Green Bay Mystery Schooner," *Inland Seas* 25.4 (1969) 267–278; D. T. Bowen, "The Mystery Ship and Its Permanent Seaport," *Inland Seas* 26.4 (1970) 266–267; C. T. McCutcheon Jr., "An Unfinished Voyage," *WoodenBoat* 52 (1983) 52–58; P. H. Spectre,"The Challenge of the Challenge," *WoodenBoat* 52 (1983) 59–65; S. Manning, "The ALVIN CLARK Revisited," *WoodenBoat* 52 (1983) 66–68; P. O'Brien *et al.*, "Sad saga of schooner Alvin Clark finally came to end this summer," *Association for Great Lakes Maritime History Newsletter* XI.4 (1994) 1–7.
6. *A. D. Patchin* worked for the People's Line in 1847, offering service from Buffalo to "any port on Lake Michigan." Classified advertisement, *Buffalo Morning Express* (*BME*), 31 March 1847. Loss of *A. D. Patchin*: *Cleveland Morning Leader* (*CML*), 30 September 1850. E. Heyl, ed., *Steamers Enrolled at Buffalo Creek, 1817–1865, Extracted by Eric Heyl from Enrollment Register* (Buffalo: Buffalo and Erie County Public Library, n.d. Typed, folio-size, bound, undated, unpaginated volume) and E. Heyl, *Indiana* history sheet (Perrysburg, OH: Institute for Great Lakes Research, n.d. Collection No. 4–Heyl, Box 5, Folder 10), II:1 date *Patchin*'s loss to 27 October 1853, but at exactly the same spot as *CML* account.
7. This information on Keating is based upon anonymously typed lists in the vertical files at the Great Lakes Historical Society in Vermilion, under the subject headings of "Vermilion I" and "Vermilion Shipping." Vermilion maritime historian G. Wakefield, in "Along the River Front," *Vermilion Photojournal*, 16 August 1979:22, stated that "Keating seems to be a stranger in the lists of old Vermilionites." In Vermilion, he is also associated with the construction of the schooners *Challenge* (1853), *Bay City* (1854) and *Africa* (1855). According to G. Wendt, *In the Wake of the Walk-In-the-Water. The Marine History of Sandusky, Ohio* (Sandusky: Commercial Printing, 1984),13, 60. In 1851, Keating may have built the 95-ton sidewheel steamer *Fremont* at the Plaster Bed shipyard in Sandusky, OH for W. B. Lockwood. In 1853, he built the schooner *Vermont* at Huron, Ohio; her lines, derived from the builder's half-hull model, are at the Smithsonian Institution's National Museum of American History (HAMMS 14–12). The following winter (1853/54), Keating also was associated with the construction of the propeller *Mount Vernon* at Huron, Ohio, according to *Daily Forest City Democrat* (Cleveland), 14 December 1853 and *CML*, 25 May 1854.
8. E. Trinter, *The Way It Was* (Vermilion, OH: Vermilion Printing, 1965), 65; "Vermilion I" vertical file at the Great Lakes Historical Society in Vermilion. Barry, *ibid.*, 192 and 196 states that *Indiana* was constructed at Goodsell's shipyard by Keating. Like Keating, Goodsell also migrated for work; according to *BME*, 1 December 1847 (citing the *Detroit Advertiser*), he built the steamer *Odd Fellow* (registered name: *Globe*) at Trenton for John Robinson in 1847.
9. R. J. Wright and J. C. Martin, *Adz, Caulk and Rivets: A History of Ship Building along Ohio's Northern Shore* (Lansing, MI: Great Lakes Visual/Research, 1995. In Press), 78–80.
10. National Archives, Record Group 41, Records of the Bureau of Marine Inspection and Navigation: Abstracts of Enrollment and Certificates of Enrollment.
11. Mervin Spencer Hawley (1807–1887) of Buffalo is the first link in the long chain between *Indiana* and that upstate New York port. He left a brief career as a school teacher to enter the dry goods business, first in Rochester and then on Central Wharf in Buffalo, which became ex-

tremely successful. A director of the Buffalo Board of Trade in 1847, he declined nomination to its presidency in 1856 (*CML*, 9 May 1856). He also was listed as a commission merchant in the 1847–1857 Buffalo commercial directories. A founder of The International Bank in 1854, he was elected its president in 1857, just in time to witness the financial panic of that year. Although the bank lost half its capital, it survived until 1864 when it finally succumbed. Hawley had a strong interest in maritime history, and published three studies on the Erie Canal from 1866 through 1872. His papers are at the library of the Buffalo and Erie County Historical Society in Buffalo.

12. Not all cargoes are documented in the local newspapers that listed port arrivals and clearances; Cleveland is particularly lacking in this regard. I am grateful to Gerald C. Metzler of Lakewood, Ohio, who shared his extensive list of regional newspaper notices of *Indiana*'s voyages over her entire career.
13. "Marine Intelligence," *BME*, 17 August 1848, publishing a memorandum of 12 August submitted by first officer Stone of the steamer *Louisiana* outbound from Chicago. An immense cleat, suitable for heavy towing, was found on the fantail section of the wreck of *Indiana*; however, it showed no wear, indicating it was not original construction. P. F. Johnston and D. S. Robinson, "The wreck of the 1848 propeller *Indiana*: interim report," *International Journal of Nautical Archaeology* 22.3 (1993) 233 and Fig. 11.
14. *BME*, 12 November 1849. On this same voyage from Detroit, *Indiana* brought three boxes of minerals (*inter alia*) for Niles & Wheeler; occasionally, other minerals shipments appear scattered among *Indiana*'s ladings.
15. *Commercial Advertiser Directory* (*CAD*) for 1847–48, 70 (a Buffalo town directory); L. Graham and F. H. Severance, *The First Hundred Years of the Buffalo Chamber of Commerce* (Buffalo: Foster & Stewart, 1945), 24–25.
16. E. Heyl, ed., *Steamers Enrolled at Buffalo Creek, 1817–1865*. I am grateful to C. Patrick Labadie for pointing out that this vessel may more properly be the 56-ton brig *T. W. Mavrice* (1838), later converted to a schooner. According to Heyl, Pratt later held outright or part ownerships in the propellers *F. W. Backus* in 1853 and *Acme* in 1858, and built the tug *Dictator* at Buffalo in 1862 for William Monteath and others.
17. Heyl, *ibid*. "Marine News" column, *BME*, 9 May 1853, has a description of *Queen of the Lakes* and her officers. *Morning Daily True Democrat* (Cleveland), 26 May 1852, describes *Cataract*, which ran in the American Transportation Company's fleet.
18. *CML*, 17 June 1854 and 11 December 1855; *CAD*, 1855:16, 1857:19, and 1858:227, respectively.
19. In early June 1852, the same Captain F. Keith lost Lucius H. Pratt's schooner *Mavice* (or *T. W. Mavrice*) just off Buffalo, when she was forced out of the channel by the steamer *Caspian* onto a pier. Four on board were killed in the accident, according to *BME* for 11 June 1852.
20. E. J. Dowling, "The Erie Fleet," *Inland Seas* 7 (1951) 204–205 and E. Heyl, *Indiana* history sheet (Perrysburg, OH: Institute for Great Lakes Research, n.d. Collection No. 4–Heyl, Box 5, Folder 10) indicate that in 1852 and 1853 *Indiana* may have been under charter to the Union Steamboat Company, part of the New York and Erie Railroad. Another secondary source attributes *Indiana*'s USC charter to a later period: Mansfield, *History of the Great Lakes* (Chicago: J. H. Beers, 1899, I: 453. Early primary sources, which seem more reliable, place the USC charter of *Indiana* in 1857: J. S. N. Sprague, "Samuel Fletcher Pratt," *PORTRAIT NOTES*, (Buffalo: Buffalo and Erie County Historical Society, 1964. Typescript of biographical sketches of the subjects represented in the oil paintings collection of the Society), 64–65 and bibliography.
21. Eastbound grain shipments in the Great Lakes were the principal cargoes during this period. D. R. Dohrmann, *Screw Propulsion in American Lake and Coastal Steam Navigation* (New Haven, CT: Yale University, Ph.D. Dissertation, 1976), 113 ff.
22. This is the only known record of this *Indiana* incident, and it is undated and otherwise uninformative. Malden is on the Canadian shore, midway between Monroe and Detroit on the American side of the strait. There was another Great Lakes steamer named *Indiana*, with which the Vermilion-built ship is often confused. The "other" *Indiana* was a 550-ton sidewheeler built in 1841 at Toledo and measuring 175 x 26 x 12. She burned at Conneaut on Lake Erie in 1848, some five years before the referenced incident.
23. *CAD*, 1852, 49–51, contains a remarkably fulsome three-page description of "Pratt & Co.'s Hardware Establishment," ostensibly penned by an interested local citizen but almost certainly written or commissioned by the "enterprising proprietors, eminently deserving of the success

which has crowned their efforts." Despite the hyperbolic tone of the piece, it contains an abundance of useful information.

24. Shipping information: E. Heyl, ed., *Steamers Enrolled at Buffalo Creek, 1817–1865*. Insurance agency: *BME*, 5 April 1850. In 1855, after his involvement with *Indiana* had ended, he was involved with the St. Clair Flats Project, a dredging project to improve navigation through the area. Graham and Severance, *ibid.*, 44–45.
25. *BME*, 2 July 1853, contains a descriptive classified advertisement for Fox's New York and Erie Line of "30 of the largest class Boats used between New York and Buffalo." *Morning Daily True Democrat* (Cleveland), 31 May 1853, contains an account of *Excelsior*'s loss the previous day in the Detroit River. Fox's 1853 and 1854 advertisements erroneously list *Charter* as a propeller rather than a sidewheel steamer.
26. *BME*, 13 March 1854. *CML*, 9 May 1856, lists him as Second Vice President of the Buffalo Board of Trade.
27. *Fashion*, *Diamond* and *Albany* ran in the Walbridge's Line between Buffalo and Cleveland. "Marine News" column, *BME*, 25 March 1851. A classified advertisement from a month later in the same newspaper for *Belle* and Capt. Perew lists G. B. Walbridge as agent. Most of this biographical sketch of Perew is derived from L. B. Lane, *Memorial and Family History of Erie County, New York* (Buffalo: Genealogical Publishing, 1906–08), Vol. 2, 398–401, with additional details from several obituaries and his descendant Charles A. Abell of Corvallis, Oregon, who kindly shared his genealogical files.
28. Cleveland *Daily True Democrat*, 17 May and 24 July 1850; *BME*, 15 and 25 October and 5 November 1850, 27 April 1851, 4 and 26 May and 23 July 1853.
29. Perew ran *Belle* ashore near Dunkirk during a fog, but she was floated off and in Buffalo three days later on 6 June 1851. There, she underwent a week of "refitting and painting" before resuming her regular sailing schedule on 16 June. "Marine News" column, *BME*, 9 and 16 June 1851. On a more personal note, Perew was listed as one of twenty-six "Honorary Managers" of a Grand Marine Festival held on 20 January 1852 — a large party open by invitation only at the Commercial Hotel in Buffalo. *BME*, 20 January 1852.
30. A clue to the competitive environment during the 1853 season is provided by an item in the "Marine News" column, *BME*, 20 June 1853: "The prospect of vessel owners is rather dull at present. As we predicted at the commencement of the season, the produce to go forward from this port did not suffice for all the vessels in the trade. The propellers alone appear sufficient to take forward what grain and provisions offer. But even these are compelled to take cargoes at remarkably low rates..." After Perew transferred to *Indiana*, *Nile* joined the People's Line under Captain W. H. Rounds, running between Chicago and Buffalo: "Marine News" column, *BME*, 14 April 1854.
31. *Nile*made the run "in 7 hours and 32 minutes — under a head of 45 pounds of steam..." "Marine News" column, *BME*, 11 August 1853. Although races were unpopular with ship owners and particularly insurers, the public loved them. *CML*, 29 May 1856, describes a local tugboat race. On 26 April 1858, *CML* devoted two full-page columns to a steamboat disaster during a race on the Mississippi. The Lake Erie slander: Anonymous, "History of Propellers and Steam Navigation" (under "Explosions of Boilers"), *Scientific American* 5 (1849/50), 384.
32. The Clipper Line advertisements appeared in *BME* from 4 April through 30 November 1854 with only a few days missing. This organizational structure is referenced as an "informal conference arrangement" in Dohrmann, *ibid.*, 110–111.
33. Anonymous, "Tonnage on the Lakes," *Democracy*(Buffalo), 28 February 1855 (Casualty List published as an Extra for the same date) for the month of April 1854.
34. Anonymous, *ibid.*, under the listing of propellers enrolled and licensed in the District of Buffalo Creek – 1854.
35. The incident was first reported in the "Marine News" column, *BME*, 23 August 1854 (citing *Cleveland Herald*). Property loss: Anonymous, *ibid.*, November 1854.
36. St. Mary's River connects Lakes Huron and Superior. *Democracy* (Buffalo), 6 November 1854 and 28 February 1855 (Casualty List).
37. Lane, *ibid.*, 400.
38. Quantities were generally limited to a few casks of ashes at a time. If wood ash, it likely would have been used for manufacturing lye for soap. However, ash was also produced by roasting pyrite (copper and iron ore). This type of ash was used to manufacture acids (hydrochloric, nitric, and sulphuric) for various industrial uses. C. Singer *et al.*, *A History of Technology* (New York and London: Oxford University Press, 1958), vol. IV, 242.
39. *CML* for 2, 4, and 10 June 1856, which describe

Indiana's competition and offer a "ride, free from the dust to which railroading at this season (*sic*)." *CML*, 6 September 1856, reported that the steamers *Ohio* and *Sultana* also would run on the Cleveland–Buffalo route for the rest of the season; two days later, it stated that the M. S. R. R. steamers were to cover the same route as well. This competition resulted in a loss in 1857 of $50,000 for the Cleveland and Buffalo Line of Steamboats and their withdrawal from this route of *Crescent City* and *Queen of the West*, which were offered for sale at a loss: *CML*, 24 April 1858.

40. Both these shipping companies were formed of large numbers of canal boats and propellers in 1854/55. Dohrmann, *ibid.*, 23. Niles & Wheeler were among the four proprietors of the American Transportation Company in 1854.
41. According to the *Indiana* vessel abstract at the Institute for Great Lakes Research in Perrysburg, Ohio, in May 1856, McNalley was First Mate and John Perew of Cleveland served as First Engineer. The primary source for this is not provided in the abstract. In the absence of contrary evidence, John Perew is presumed to be a relative of Frank Perew — possibly a cousin or nephew.
42. *BME*, 29 September 1856, citing *Cleveland Herald* from the previous day. Ironically, *Indiana* had taken shelter from a heavy gale at Point Abino on 25 October 1851; she was not so lucky there this time. "Marine News" column, *BME*, 25 October 1851. Annual wreck, casualty and loss reports (covering the previous season) were published in regional newspapers, such as *BME*, early each year (January or February).
43. "Marine Intelligence" column, *BME*, 31 March 1857, and *Cleveland Herald*, 1 April 1857. *Indiana*'s principal competitors for freight on this route in 1857 were *Elmira* and *Olean* [sic]. *CML*, 27 April 1857.
44. G. H. Minor, *The Erie System...Organization and Corporate History...and Its Predecessor Companies* (New York: Wilbert Garrison, 1911), 133, 143, and 159 ff.; Dowling, *ibid.*; Mansfield, *ibid.*, I, 453. Some secondary sources state that *Indiana* was chartered to the Union Steamboat Company as early as 1852. The date of establishment used here is from the official company history, which sets USC incorporation in the state of New York on 15 April 1854. Minor, *ibid.*, 159.
45. *Detroit Daily Free Press* (*DDFP*), 22 October 1858, citing *Cleveland Review*, 17 October. The loss figure is from the ship's casualty report in the Institute for Great Lakes Research files. Perew suffered another marine casualty toward the end of 1857, when he was forced to abandon his bark *Oliver Lee* after being unable to free her from the surrounding four feet of ice (*CML*, 30 November 1857).
46. K. D. LaFayette, "The Sinking of the Steamer Indiana," *Inland Seas* 36.2 (1980) 119; *BME*, 17 April 1858; *Cleveland Plain Dealer*, 14 June 1858. One contemporary source names A.C. Bancroft; several others name E.C. Bancroft as *Indiana*'s charterer and the Detroit agent for the NY & Erie Railroad. *DDFP*, 12 June 1858, valued the propeller "at about $13,000" after her winter refit.
47. "Withdrawal of the Steamers" addresses this issue and the means by which the steamship-owning railroads made it inconvenient for passengers and freight to travel by water. *CML*, 11 September 1857.
48. Ironically, the only source of information for *Indiana*'s connection with the People's Line is *DDFP*, 10 June 1858, four days after she sank. The Cleveland Iron Mining Company was formed in 1847 and incorporated in Michigan in 1850. After the Sault Ste. Marie locks opened in 1855, linking Lakes Superior and Huron to water traffic, the company began exporting large quantities of iron ore from their mines at Marquette to Cleveland. The company's early history: H.S. Harrison, *The Cleveland–Cliffs Iron Company* (New York: Newcomen Society in North America, 1974), 7–12; Van Tassel and Grabowski, *ibid.*, 222–223 and bibliography; *CML*, 19 September 1854; E. H. Rankin "Marquette's Iron Ore Docks," *Inland Seas* 23.3 (1967) 233–234 (*inter alia*).
49. *CML*, 7 June 1858. Coincidentally, the day before *Indiana*'s deckhand died, her partner *North America* also lost overboard a passenger, who drowned. *CML*, 9 June 1858.
50. Among the fifteen unnamed crew were probably a Second Engineer, a First (and Second?) Mate, several deckhands, and possibly a cook as well. Judging from contemporary accounts, a wheelsman (helmsman) and clerk may also have served aboard a ship of *Indiana*'s size, type and purpose. One of *Indiana*'s former engineers, W.A. Lyon, was named in an 1857 newspaper description of the new propeller *Fountain City*. *CML*, 20 July 1857.
51. This narrative of *Indiana*'s wrecking is pieced together from several newspapers which vary in some minor details; hence the range of times and distances, etc. The most detailed accounts are

from *CML*, 14 June 1858; *Cleveland Plain Dealer*, 12 June 1858; *Painesville Telegraph*, 17 June 1858 (citing *Cleveland Herald*); *Lake Superior Miner*, 12 June 1858; *DDFP*, 12 June 1858. The nearest land to the wreck site is Crisp Point, where a lifesaving station was built in 1875/76. J. F. Wolff, Jr., "Shipwreck Country Revisited," *Inland Seas* 23.2 (1967) 104, 107.

52. I am grateful to C. Patrick Labadie for suggesting an alternative that the writer may have meant stern pipe rather than steam pipe in this context. In either event, evidence is lacking and the final result was the same.
53. *Painesville Telegraph*, 17 June 1858, citing *Cleveland Herald*. *CML*, 14 June 1858, valued *Indiana* at $20,000; most of the other contemporary sources offer a somewhat lower figure.
54. Barry, *ibid.*, 193–194; Wright and Martin, *ibid.*, 78–79 are the sole secondary sources for this sale in 1849; however, Barry names Goodsell Benjamin rather than Burton. Barry further names Bradley's partner in the purchase variously as Isaac Nicholson or Nicholas. Other secondary sources name him Isaac W. Nichols. Van Tassel and Grabowski, *ibid.*, 119, date the sale to 1853, when the shipbuilding firm of Bradley & Cobb was formed. Among the ships — all schooners — they built at Vermilion were the 190-ton *Oregon* (1853), the 238-ton *Challenge* (1853), the 190-ton *Bay City* (1854), the 359-ton *C. C. Griswold* (1855), and the 390-ton *Exchange* (1856).
55. Among the Cleveland-period schooners Bradley and Cobb built at Vermilion were the 418-ton *S. H. Kimball* (1861), the 412-ton *David Wagstaff* (1863), the 370-ton *J. F. Card*, 568-ton *Escabana* (1865), and the 850-ton *Negaunee* (1867). The wreck of one of Bradley's eponymous vessels, the schooner *Alva Bradley*, has been located and assessed off North Manitou Island, MI; see J. K. Jaworski, and J. Allen, "Schooner ALVA BRADLEY, Shipwreck Site," *National Register of Historic Places Registration Form*, prepared 12 August 1993 (Washington, DC: National Park Service, 1993). She originally belonged to Bradley and his partners and sank three times over her long career; at the end she belonged to his son Morris.
56. Van Tassel and Grabowski, *ibid.*, 119; Avery, *ibid.*, II, 426–429; Havighurst, *ibid.*, 333–334; Coates, *ibid.*, II, 312–314, *Cleveland Plain Dealer* and *Cleveland Leader & Morning Herald*, 3 December 1885.
57. The schooner-barge *Ahira Cobb:* J. O. Greenwood, *Namesakes of the Lakes* (Cleveland: Freshwater Press, 1970), Vol. 9. Biographical information on Cobb: Editors, *Biographical Cyclopædia and Portrait Gallery* (Cincinnati: Western Biographical Publishing and University Microfilms International, 1884), II, 500–501; Avery, *ibid.*, 52–54. Ahira Cobb's great-grandson Carl B. Cobb was kind enough to share his family genealogical files and sources for this article.
58. Biography on Perew: Lane, *ibid.*, II, 399–400; *Buffalo Commercial Advertiser & Journal*; *Buffalo Daily Courier*; *BME*, all for 5 July 1898. See also notes 38 and 40, above.
59. Fox River in the Great Lakes region is a small body of water in Wisconsin connecting Lakes Winnebago and Michigan. It was improved to allow unimpeded navigation from Green Bay to Lake Winnebago, which earlier some waterfalls had blocked. *CML*, 3 June 1856. Histories of the various vessels named *Frank Perew*: R. Mannesto, "White Fish Point Survey," *Stem to Stern* 8 (1992) 11; J. F. Wolff, Jr., *Lake Superior Shipwrecks* (Duluth, Minnesota: Lake Superior Port Cities, 1990), 64; Mansfield, *ibid.*, 873.
60. J. F. Wolff, Jr., "Salvaging the Engine of the *Indiana*," *Inland Seas* 35.4 (1979) 293–294; R. J. Wright, "The Indiana Salvage: Part I," *Detroit Marine Historian* 33.4 (1979) 1–4; "The Indiana Salvage: Part II," *Detroit Marine Historian* 33.5 (1980) 2–4 for partially accurate accounts of the initial recovery. Later archaeological fieldwork on the wreck site: Johnston and Robinson, *ibid.*
61. *CML*, 1 December 1855, has a lengthy article on lake disasters that offers some reasons for vessel losses as "[in]sufficient attention…to the models and strength of vessels" and the "almost constant habit of over-loading them." D. P. Dobbins, *Proceedings of the Board of Marine Inspectors of the Association of Lake Underwriters, Held at Buffalo, August, 1856* (Buffalo: Murray & Baker, 1856), 9, states: "This Board of Inspectors… would also suggest that better means be taken to secure the hatchways and other openings in the decks of steam vessels, and more especially of propellers, as it is believed that many of the serious disasters occurring, are…from being overloaded." While *Indiana*'s rated tonnage was 349 tons (volumetric), she was transporting 280 tons of ore (by weight) when she sank, which may have overloaded her. How that cargo was stowed also would have affected her stability. It is possible that the ore weight may have caused hogging, which could have bent or stressed the propeller shaft. Curiously, from 1854 through 1856,

accounts of deck loads on propellers begin to appear in the contemporary newspapers, either as a relatively new phenomenon or one only then noticed. In the 1854 casualty list in the Buffalo *Democracy*, 28 February 1855, three of thirteen deck loads jettisoned in various sorts of casualties were from propellers. *CML*, 22 October 1856 and 1 November 1856, respectively describe a 70-ton deck load on the propeller *Iron City* and a 150-ton deck load of merchandise aboard the propeller *Globe*. *CML*, 25 and 30 October, 1 and 13 November and 1 December 1856, offer other accounts of propeller deck loads. After this 1850s spurt, the subject is rarely discussed again in the regional papers, perhaps indicating that the problem was addressed. However, main- and spar-deck loads were carried as late as ca. 1970 — as long as the package freight trade lasted. C. Patrick Labadie, Pers. Comm., 20 July 1995.

62. Independently of the loss of *Indiana*, *CML*, 11 June 1858, discusses various reasons for breakdowns of propeller machinery, including shaft heating and wear as well as rough and unbalanced propeller blades.
63. Anonymous, "The Cuyahoga Works," *American Railroad Journal*, 15 April 1848:242, lists engines for the propellers *Montezuma*, *Ohio*, and an unnamed vessel under construction by "the Messrs. Turner, for Mr. N.C. Winslow." The article continues, stating "...the Cuyahoga Works construct the only low pressure engines that are made west of New York city...we trust there will no longer be an excuse for transporting engines of any description from New York to be used on our lakes." The Cuyahoga Steam Furnace Company papers are at the Western Reserve Historical Society in Cleveland. Information on the firm: Van Tassel and Grabowski, *ibid.*, 324–325; J. H. White, Jr., "The Cuyahoga Steam Furnace Company," *Smithsonian Journal of History* 3.1 (1968) 59–76; J. Large Jr., processor, *The Cuyahoga Steam Furnace Company. a Register of Its Papers in The Western Reserve Historical Society* (Cleveland: Western Reserve Historical Society, 1964). Despite the absence of *Indiana* connections, the CSFC steamboat contracts indicate that the cost for a mid-nineteenth century marine steam system (engine, boiler, tools, etc.) was ca. $7,000.
64. Editors, "33. For a Steam Boiler; Levi Burnell, Elyria, Lorain County, Ohio, May 21," *Journal of the Franklin Institute* 14 (1834), 403, and patent papers of Levi Burnell, 21 May 1834.
65. Parmalee (alt. Parmilee, Parmely): T. D. Stetson, "The Bee-Hive Boiler of Lake Erie," *Journal of the Franklin Institute* 27 (1854), 356–358, and *CML*, 21 August 1854 (under Phoenix Steam Engine Works); 16 October 1855 (under Captain W.C. Nelson); 3 May 1856 (under Machinists); 19 August 1856 (under The Kenosha). Parmalee-boilered ships: Stetson, *ibid.* (listing *Boston*, *Troy*, *Niagara*, *Forest Queen*, *Westmoreland*, *Prairie State*, *Michigan*, and *Ogdensburgh*); *CML*, *ibid.* (listing *Milwaukee* and *J. H. Foss*). Among contemporary ships with Phoenix Foundry machinery were the steam tug *Dick Tinto* (*CML*, 16 October 1855) and People's Line propeller *Kenosha* (*CML*, 19 August 1856).
66. Sandusky foundries in business in 1848 include the establishments of Camp & Johnson, A. A. Camp's Sandusky Foundry, and possibly N.G. Olds. Wendt, *ibid.*; G. Wendt, Pers. Comm., 9 March 1993; F. Hocker, "Indiana's Engine Builder," (Washington, DC: Smithsonian Institution NMAH Division of Transportation, 1984. Unpublished typescript).
67. Hocker, *ibid.*, 1, counted eighty-five Great Lakes steamers with sourced machinery in E. Heyl's six volume *Early American Steamers* (Buffalo: Eric Heyl, 1953–1969), noting that none had Erie built engines.
68. L. Allen and Directors, "in the Matter of the Application of the Directors of the Buff Steam Engine Works a dissolution thereof," Petition filed at the Supreme Court, Erie County Court House, Buffalo, on 11 July 1857, 18. The petition includes the names of several of *Indiana*'s previous owners as debtors. I am indebted to Paul F. Redding and Edward J. Patton of the Lower Lakes Historical Association in Buffalo for bringing this remarkable document to my attention.
69. Ahira Cobb's ledger is owned by his great-grandson Carl B. Cobb, who has been very helpful in interpreting its contents.
70. Samuel L. Baker and John McClelland were listed as machinists in the Cleveland city directories for 1846/47. The 1852 business directory lists McClelland and Parmalee as co-owners of the Phoenix Foundry; *CML*, 3 May 1856 contains a classified advertisement (under "Machinists") for the "PHOENIX FOUNDRY. – BAKER, PARMALEE & CO., manufacturers of steam engines for Boats, Propellers..." etc. Clearly, Parmalee, Baker and McClelland were all closely connected during the decade under investigation, strengthening the case for one or all of them to have been involved with *Indiana*'s

machinery in some capacity.

71. W. Stephenson, compiler, *General Business Directory of the City of Cleveland* (Cleveland: Smead & Cowles, 1848/49), 91, for a half-page Spang & Co. advertisement. Further background: Editors, *The National Cyclopædia of American Biography* (New York: J. T. White, 1935), vol. 22, 446–447, (entries for J. W. and Henry Chalfant); P. F. Paskoff ed., *Iron and Steel in the Nineteenth Century* (New York: Facts on File, 1989), 317–318. In 1854, the firm built an immense iron warehouse in Cleveland, a description of which is in *CML*, 29 September 1854. Spang & Co.'s business records are at the library of the Historical Society of Western Pennsylvania in Pittsburgh.
72. R. Macfarlane, *History of Propellers and Steam Navigation* (New York: George P. Putnam, 1851), 119–20 and fig. 77.
73. Loper's propeller-related patents are Nos. 3,459 (28 February 1844), 3,786 (9 October 1844), and 4,285 (26 November 1845). He took out several others as well up to 1861 that ranged from a sausage machine to a gun barrel. Mystic Seaport Museum has Loper's original patent model for No. 3,786. The twist: J. W. Nystrom, *A Treatise on Screw Propellers and their Steam Engines* (Philadelphia: Henry Cairy Baird, 1852), 94–97 (and Plate W); C.H. Haswell, "Civil Engineering: Office of Engineer-In-Chief, U.S.N., January 30, 1849," *Journal of the Franklin Institute* XVII.47 (1849) 293. The submergence: W. Hamilton, "Loper's Propellers and Hunter's Submerged Wheels," *Journal of the Franklin Institute* 3.8 (1844) 24. The lawsuit: Haswell, *ibid.* and his "Report on Propellers," *Scientific American* 5.3 (1849) 22 and 5.4 (1849):27.
74. Nystrom, *ibid.*, Plate W illustrates another Loper propeller, but this one is cast in a single piece, as was more common with later examples. I am grateful to Richard K. Anderson, Jr. and Donald E. Ridley for their analytical assistance with the *Indiana* propeller and contemporary sources. Loper's propeller: T. D. Stetson, "On Elevated Screw Propellers," *The Monthly Nautical Magazine* II. II (1855) 141–146; C. Ridgely-Nevitt, *American Steamships on the Atlantic* (Newark, DE: University of Delaware Press, 1981), 189–191, 198–199, 202, chapter endnotes.
75. Editors, "Steamboats on the Upper Lakes," *Scientific American* 4.29 (1849), 126.
76. Dohrmann, *ibid.*, 55 ff., 118–136; J. C. Martin, *Sailing the Freshwater Seas: a Social History of Life Aboard the Commercial Sailing Vessels of the United States and Canada on the Great Lakes, 1815–1930* (Perrysburg, OH: Bowling Green State University, 1995. Ph.D. Dissertation), 160–161.

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Readers' Forum

THE GENDER OF LUKE RYAN — WAS HE OR WASN'T SHE?

Donald A. Petrie's essay, "The Piracy Trial of Luke Ryan" (*American Neptune*, Vol. 55, No. 3), offers much material not generally known to readers of the maritime history of the American Revolution. His research is commendable and his presentation straightforward. It is a pity that Mr. Petrie lacks the speculative faculty to follow his own material far enough to confront a possible implication. Or, perhaps, he is so bound by the view of history as a record of the acts of men that he cannot ask the question: Was Luke Ryan a woman?

Let us ask a few questions about Mr. Petrie's narrative:

- At the piracy trial in 1782, James Long testified on Ryan's behalf that he had known Ryan when, as a young child, he had arrived from France. "He was an effeminate child," Mr. Long said. Twenty years later, "effeminate" is still the word used by the London press to describe Ryan on his arrival from Edinburgh to be tried for piracy.
- After privateering vigorously with John Marchant for four months in 1779, Ryan is suddenly "too ill" to sail for several months. Macatter and Dowlin sail without him. However, Ryan's illness does not deter his "particular friend," the financier John Torris, from confidently purchasing the cutter *Fearnot* for Ryan to command and, right on schedule, Ryan appears and sails off to harass the Hebrides. To many a woman who has resorted to "illness" to conceal a secret pregnancy, that story would be all too familiar.
- At the most dramatic and threatening moment of his life, as Judge Marriott sentenced him to death, Luke Ryan's response was serenity. Representatives of the press in the crowded courtroom were astonished that Ryan was "perfectly indifferent at hearing the fatal verdict." Did Luke Ryan have a secret that no one else in Judge Marriott's courtroom but Ed Macatter shared? Was he supremely confident that the Marshall of the Admiralty could not execute him and hang his body in chains "in some conspicuous place" because that body would have revealed a terrible truth, that the great Commissioners for Executing the Office of Lord High Admiral of Great Britain and Ireland had been made fools of by a young Irishwoman?
- Mr. Petrie ends his narrative with the sad note that Ryan's wife and children did not share with him his confinement in debtor's prison as permitted by contemporary custom. Of the children's existence there can be no doubt, because it was his inability to pay for their medical expenses which caused Ryan to be arrested for debt. But Mr. Petrie never bothers to give us the slightest evidence that the "wife" ever existed. She is simply implied from Ryan's masculinity. It is curious that when Mary Macatter writes to Franklin, pleading her impoverished state and that of the wives of the other Irish privateering captains, she does not mention Ryan's wife.

Lois Ames
North Sudbury, MA

Donald Petrie responds: Lois Ames is to be commended for reminding this old maritime historian (and through your columns, all maritime historians) that our history may have been much more diverse, as to both race and gender, than our writings and our records necessarily indicate. I suppose that I have spent as much time as anyone researching the life of Luke Ryan. But if you ask me the direct question of whether he was a man or she was a woman, I am at a loss to offer conclusive proof either way.

SHIP MODELS FROM THE GREAT AGE OF SAIL, 1600-1850

INTERNATIONAL CONFERENCE

To be held at
NATIONAL MARITIME MUSEUM
GREENWICH, LONDON

18-20 APRIL 1996

This conference will bring together all those interested in ship models: makers, collectors, historians, museum curators and conservators, and enthusiasts. It will study ship models in their own right and attempt to raise them to a higher plane as historic objects.

The conference will be linked to the NMM publication *Ship Models: their Purpose and Development* by Brian Lavery and Simon Stephens but will consider models from collections all over the world. There will an opportunity to visit the Museum's reserve collection and see models which are not normally accessible to the public.

If you would like to give a paper, phone Brian Lavery on 0181 858 4422.

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News

The study of maritime history is alive and well on the international level as witnessed by the recent meeting of the International Commission on Maritime History (ICMH) in Montreal. Five days of presentations at ICMH sessions was complemented by papers and panels at the International Congress of Historical Sciences, the umbrella organization for historians of which the ICMH is an affiliate. Presentations were made by scholars from across the globe. Lewis (Skip) Fischer of Canada, the conference secretary, arranged an excellent program. Australian Frank Broeze completed his five-year term, which included interim conferences in Liverpool, Perth, Milan, and St. John's, Newfoundland. Peter Davies, the affable and productive maritime historian at Liverpool University, is the new president. The next interim conference of the ICMH will be in Amsterdam 5–8 June 1996, in conjunction with the Second International Congress of Maritime History. The Congress and Commission will next meet together in 2000 at what should be a memorable millennial gathering in the important maritime center of Oslo, Norway.

Timothy J. Runyan
East Carolina University

WEB SITES

Three maritime museums have developed World Wide Web sites on the Internet: Peabody Essex Museum, Mariners' Museum, and Mystic Seaport Museum. Each site features general information about the museum and additional pages detailing each Museum's collection, galleries, exhibitions, Library and archives, educational opportunities, photographic services, museum shop and membership opportunities. The Peabody Essex Museum site is at http://www.star.net/salem/pem/default.hm. Mariners' Web site is at http./www.mariner.org/mariner. Mystic's address is at http://www.mystic.org/.

SCHOLARSHIP

The Society of Naval Architects and Marine Engineers have announced scholarships at both graduate and undergraduate levels, to encourage men and women to pursue studies in naval architecture, marine engineering or fields related such as ocean engineering. Applications for Fall 1996 may be obtained from Society headquarters. The completed application should be directed to Mr. Francis M. Cagliari, Executive Director of the Society, 601 Pavonia Avenue, Jersey City, NJ 07306, before the closing date of 1 February, 1996.

CALL FOR PAPERS

The Canadian Nautical Research Society have issued a call for papers for their 1996 conference to be held at Kingston, Ontario, on 23–25 May 1996. The selected conference theme for papers is: Commerce and War. Kingston's location, fortification, and link to inland transportation provide many connections to themes that might be explored. Aspects of commercial rivalry as well as relationships of war and commerce, and comparisons with other trading patterns are also suggested. Papers are normally considered for publication in the Society's refereed journal *The Northern Mariner/Le marin du nord.* Proposals for individual papers or complete sessions should be sent to: Lieutenant-Commander William Glover, Directorate of History, National Defence Headquarters, Ottawa, Ontario, K1A 0K2.

PARK SERVICE WORKSHOP

The National Park Service National Maritime Initiative announces a workshop designed for national, state, and local park personnel who manage historic maritime resources. The workshop will be held in April, 1996, and will be hosted by the Salem Maritime National Historic Site and the park's cooperating associations in Salem, Massachusetts. For more information, contact Hallie Brooker at (202) 343-8170.

Book Reviews

GILLIAN HUTCHINSON, *Medieval Ships and Shipping* (Rutherford, NJ: Fairleigh Dickinson Press, 1994), xi + 219 pages, illustrations, bibliography, index. ISBN 0-8386-3628-4. $45.00.

The author, curator of archaeology at the National Maritime Museum at Greenwich, has tried in this book "to bring together information about material remains of shipping activity and to explain their significance by seeing them in the context of medieval maritime Britain" (page 1). The first two chapters deal with shipbuilding traditions and their evolution, the next with rigging and steering, followed by one exploring developments in ships outside of the British Isles. The remaining six chapters treat specific aspects of shipping, including the carrying trade, ports, inland water transport, fishing, fighting ships, and navigation. The latter topics, with the exception of ships at war, rarely get extensive treatment and are, in general, a welcome addition. In each instance, it is the archaeological evidence which had been found and what that evidence can do to aid understanding which interests the author. In many instances, other sources offer more complete information; these, too, get consideration.

There is a great deal included that is the product of the extensive and highly successful recent research in nautical archaeology. The field has developed rapidly in the last four decades and, if nothing else, this book draws together much of the information. The author takes the title broadly and so makes a valiant effort to deal with a broad range of issues and bring together, as have others in the past, the burgeoning information from archaeology and other types of scholarship on ships. The book is extensively and amply illustrated, with references in the texts invariably to the appropriate illustration.

The book tends very heavily toward the fourteenth and fifteenth centuries, not only because there is more pictorial and written evidence, but also because there is more archaeological evidence. While the book is heavily British in orientation and in sources, at the same time there is extensive use of archaeological information from the Continent. The basic characteristics of ship construction through the period are described with a good deal of detail. The promise of avoiding being too technical is not fulfilled, and at times some specifics seem unnecessary. On the other hand, for example, the description of caravel building, the transition from traditional northern clinker building (page 44), and the technology that transition implied, are described in a clear and transparent way. The author rightly points to the critical role of economics and physical circumstances in the decisions of shippers and shipbuilders. She points to the importance of the cargoes ships carried, the routes they sailed, and the arrangements for loading and unloading which all had consequences for ship design (page 88). She does describe, and rightly make much of, the role of bad weather, especially in the winter, on ships and on decisions by shippers. The discussion of stowage and ports is rare and based squarely on the evidence, and so is extremely valuable.

Hutchinson catalogues what has been learned, and at times the book begins to read more like a series of reports on what was found at different sites than a history. That is, to a degree, by plan. The author eschews stringing together the archaeological information of various ship finds to create a typology of ship designs, a story imposed from the great distance of centuries, because of her fear that such a construct would fall like a house of cards with a new archaeological discovery. The decision to treat matters topically, especially in the latter part of the book, creates repetition with certain digs and certain information from those digs being repeated in different contexts. The organization is neither chronological, which would give a story about the evolution of shipbuilding, nor by dig, making it hard to piece together what is learned from each individual find. The problem of how to attack what has been learned is a difficult one; it is not surprising that this author, like most others, has not solved it.

This is a short book. The extensive illustrations, along with the valuable glossary and extensive bibliography, guarantee that. The latter is a bit idiosyncratic. It covers a broad range of subjects with many recent works, so it would be churlish to point out the omissions. The prediction of a great future for waterfront archaeology is somewhat suspect. The amount of space devoted to inland boats and archaeological finds of such vessels is unique, but the value of the exercise is difficult to appreciate. The same is true with the reporting of finds of stones to do with ships, such as anchors or weights for fishnets, a reporting which the author finds hard to resist. The conclusion is a paragraph tacked onto the discussion of navigation and pilotage. Such a short statement at the end of such an effort suggests that there is something missing in the narrative and in the development of arguments. The style is straightforward and so a bit simplistic, more consistent with a report. Since the book is, indeed, very much a report, it may prove more valuable as a work to consult rather than one to read.

RICHARD W. UNGER

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ADRIAN B. CARUNA, *The History of English Sea Ordnance*. Vol. I: *The Age of Evolution, 1523–1715* (Ashley Lodge, Rotherfield, East Sussex, England: Jean Boudroit Publications, 1994), 237 pages, index, bibliography. ISBN 0-948864-20-6. £50.00.

Adrian Bernard Caruna is a former Royal Artillery officer and leading expert on English artillery and on shooting historic ordnance. One of his earlier books, *The Pocket Artillerist* (1992), explains safe firing procedures for those who might want to fire antique muzzle-loading ordnance. Caruna has also written a number of short studies for the Museum Restoration Service, which press has carved out a niche for itself as the preeminent publisher of books on muzzle-loading artillery. Caruna's short books include studies of Tudor artillery, the light 3-pounders of Pattison and Townshend, British artillery ammunition in 1780, and the British light 6-pounder battalion gun of 1776.

The History of English Sea Ordnance, Vol. I: *The Age of Evolution, 1523–1715* is to be the first of three volumes treating Royal Navy smoothbore, muzzle-loading artillery. The second volume, *The Age of the System*, will cover the period from 1715 to 1815; the third, *The Age of Change*, is to treat the years 1815 to 1875 and end with the introduction of the breech-loading rifled ordnance aboard Royal Navy ships. *The Age of Evolution, 1523–1715* is a handsome, well-illustrated coffee table format book.

Warships are basically weapons platforms, and at the end of the fifteenth century, an important change occurred in the way they carried their cannon. Up to that time, men-of-war carried a few heavy guns in the waist to be fired over and through the bulwarks, and many lighter guns in the castles at each end. Castles built too high and weighed down with ordnance made ships such as the *Henry Grâce à Dieu* unwieldy and top heavy. The change was to carry heavier guns between decks and fire them out of holes, known as gunports, cut in the ship's sides. This cleared the way for much heavier guns at sea. Castles were reduced, and in 1637, the first three-decker was built, *The Sovereign of the Seas*.

Soon after this, the guns themselves underwent change. The blast furnace made possible the casting of guns and, over time, the safer and stronger cast muzzle-loader replaced the wrought iron breech-loading gun. Bronze muzzle-loaders appeared about 1500, those in the cheaper iron about 1550.

The English led this revolution in naval ordnance. As Caruna notes, they "early exhibited both a talent and a passion for the use of artillery both by sea and land." Much of this was on the instigation of King Henry VIII, the acknowledged father of the Royal Navy and British naval ordnance. Henry introduced new gunfounding techniques into England and developed a national munitions industry. He was also responsible for introducing heavy guns aboard

English ships. In 1543, the first large English iron gun was cast on his orders at Buxted, in Sussex. By 1600, annual production of cannon in Sussex had grown to 800 to 1,000 tons, and English ordnance was recognized as the best in the world.

The book is based on extensive research in such primary source depositories as the British Library, the Public Record Office, the Bodleian Library, and the National Maritime Museum. It contains excellent line drawings of representative ordnance; it also has numerous tables, including those showing numbers of each classification of ordnance aboard ships.

Caruna has also made an important distinction in this book. He based it on surveys of ordnance, specifically the Naval Ordnance Survey, rather than various "establishments." The former are fact, and the latter — which were the ideal — are largely chimeras.

Caruna chose 1523 as his starting point, when Henry VIII recruited his first gunfounders (from Venice) to build up the English armaments industry. He begins by treating such topics as gun platforms, the Boards of Ordnance, gunpowder, classifications of guns, their longevity, and influences on gun design. The first eight chapters move chronologically through the Tudor and Stuart monarchs, beginning with Henry VIII and ending with Queen Anne. In each chapter, Caruna discusses the ordnance changes of that particular ruler's reign. He also introduces writings of that time period on ordnance practice and includes inventories of ordnance; line drawings reveal the evolution over time of the guns themselves. Chapter 9 treats the evolution of naval gun carriages; Chapter 10 deals with sea service ammunition and ordnance stores; Chapter 11 is devoted to sea mortars; and Chapter 12 is a brief summary and conclusion. There is a disappointingly small single-page bibliography and notes on sources, a general index, and a very helpful separate index of named ships.

As Caruna makes clear, the period he covers in the book was one of great change. It began with a fleet armed exclusively with bronze guns, many of which used stone shot; it ended with virtually an all-iron gun fleet totally reliant on iron shot and shell. There were also revolutions in the size of the guns — ships became stronger and the guns grew larger — and in gunpowder as ordnance changed from serpentine to corned powder.

This is a fine book that will appeal to all with an interest in the subject. Specialists will find much in it that is useful. It is regrettable that there are not more illustrations of the guns themselves. Despite this, those interested in the evolution of naval ordnance can only eagerly await Caruna's next two volumes.

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SINNAPPAH ARASARATNAM, *Maritime India in the Seventeenth Century* (Delhi: Oxford University Press, 1994), 5¾" by 8¾", ix + 294 pages, 4 maps, bibliography, notes. $24.95.

In the seventeenth century, India entered a decisive period during which European presence became firmly established in the subcontinent. Portuguese, Dutch, British, French, and Danish traders arrived on the scene and began to exert influence on the commodities and markets. Their activity increased in the course of the century but remained limited to the ports and to commerce. Indian owners, especially the extensive Mughal empire, remained in control of the subcontinent. Not until the next century would European kingdoms present a serious threat to Indian ones.

Dr. Sinnappah Arasaratnam, professor of history at the University of New England in Australia, is a senior scholar of South Asian maritime history and eminently qualified to survey this critical century of Indian Ocean trade. Dr. Arasaratnam's review opens with a very useful background chapter on the geography of the region: the monsoon winds with their bi-yearly alternation from southwest to northeast, the rivers that empty into the Bay of Bengal and the Arabian Sea, and other coastal features which have influenced the placements and capacities of ports. This chapter also reviews the principal ports of seventeenth century India. The second chapter extends the background with a historical sketch of earlier Indian Ocean maritime history.

Arasaratnam organizes the main section of his survey around four geographical divisions which mirror political and commercial arrangements in the subcontinent: Jugarat and Sind in western India, which were controlled by the Mughal empire and oriented to the Arabian peninsula and East Africa for trade; the Malabar–Kanara coast of southwestern India, which was divided among several small kingdoms from whose ports trade was directed westward to Arabia and Africa and eastward to Southeast Asia; the Coromandel Coast of southeastern India, which had longstanding commercial connections to southeast Asia through its merchant castes; and Bengal in the northeast, later to become the most important commercial center, which was during the seventeenth century the least important region in India's long distance trade.

Four chapters deal with these regions, each enumerating the ports, the commodities dealt in, the traders active there, and their destinations. Each chapter follows changes in the status of these over the course of the century. Chapters on relationships between ruling states in the region and seaborne commerce, on the mercantile communities operating during the period in South Asia, and on the characteristics of shipping complete the presentation. Because the region was such a dynamic center of trade, it is a considerable feat to have delineated the states, traders, commodities, and routes involved in commerce there. Arasaratnam succeeds in providing a comprehensive overview of Indian Ocean commerce during the seventeenth century, and his contribution will be a lasting one for having done so.

In the final chapter, Arasaratnam briefly suggests some interpretations of maritime trade in seventeenth century India worthy of fuller treatment. He proposes, for example, that Indian states were more porous than other Asian polities (especially Japan and China), never striving to control access to their ports, even by Western interlopers. He suggests that ports in India were places of considerable ethnic diversity and religious tolerance not to be found in the towns of the more homogeneous and orthodox interior. He also proposes that profits made in trade were transmitted inland, where the heart of these states lay, to support agriculture, administration, and the military. Arasaratnam's most interesting suggestion is that, contrary to much of the literature on trade in South Asia, merchants were in the mainstream of society, not tangential to it. This book could have been a more important contribution to historiography and a more compelling reading experience, had it been organized around interpretations such as these rather than as a straightforward descriptive account.

A survey, like one presented in this book, should provide an orientation for scholars in adjacent subjects. For example, students of the Mughal empire, or of European trade, or of Indian Ocean trade in later centuries should all be able to profit from Arasaratnam's work. Unfortunately, as a survey, *Maritime India in the Seventeenth Century* is frustrating on several counts. The maps, critical as orienting devices, are woefully inadequate. Only four are provided, depicting the coastlines of the regions described, indicating the principal ports in each. Neither the location of the Indian states to which the ports belong, nor the trading destinations in the Arabian peninsula, Africa, and southeast Asia are shown. For example, on the North Coromandel map, the reader cannot tell which ports belong to the kingdom of Bijapur and which to Golconda, though this distinction is important in the text.

A second major source of frustration is the absence of footnotes in the text. In place of these, the author has chosen to present bibliographical notes for each chapter. These bibliographical sections, which give the principal primary and secondary sources consulted, are very useful, but they are in no way a replacement for footnotes. If a reader is interested in learning more about, for example, Dutch interference with trade between Coromandel and Achin in mid-century (page 134), he or she will not know where among the several primary and secondary works to find the source for this particular information.

Less significant, though still irksome (espe cially in the absence of a glossary) is the use of spellings which are eccentric and not always consistent. Both Melaka and Malacaa (page 67) occur; Achin is usually given as Aceh, and Pulicat as Paleacat. Quilon is given on the map (page 91), but Coylan occurs in the text (page 102). Also, terms like *shroff* (banker, accountant) and *shahbandar* (harbor master) are given without glosses, a real annoyance to scholars who are not South Asia specialists.

Despite these shortcomings, there are many who will benefit from the broad strokes connecting segments of the Indian Ocean trading network with which they are familiar to those they have not known.

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RENÉ DE LA PEDRAJA, *A Historical Dictionary of the U.S. Merchant Marine and Shipping Industry Since the Introduction of Steam* (Westport, CT: Greenwood Press, 1994), 768 pages. ISBN 0-313-27225-5. $99.95.

Published on the coattails of his *The Rise and Decline of U.S. Merchant Shipping in the Twentieth Century* (New York: Twayne Publishers, 1992), De la Pedraja's *Dictionary* is a logical extension of the research done on that initial work. De la Pedraja, Professor of History at Canisius College, has put together a wonderful collection of over five hundred entries covering people, ships, companies, unions, government agencies, laws, and almost anything else to do with merchant steam shipping. The key here is steam, for although the title states "*since the introduction of steam*," implying *all* types of merchant shipping since circa 1800, De la Pedraja concentrates almost exclusively on steam and motorized vessels and the companies that owned them. However, another thousand pages would be necessary to deal properly with sail in this format. As with most topical dictionaries with a limited publishing run, this one carries a hefty price tag; adding the category of sail to it would have made the price prohibitive.

Called a dictionary, this work's entries follow more closely an encyclopedic format. Each subject is dealt with in detail, and numerous cross references are made within each entry to other subjects of interest. The entry of *Sailors' Union of the Pacific*, for example, covers over five pages and refers the reader to more than twenty other topics covered in the dictionary, from the terms "coastwise" and "crimps" to the names of several organizations, including the "Committee for Maritime Unity." At the end of the article is a list of references from which Professor De la Pedraja obtained his information.

This author must also be commended for including a first-rate index in his book. The index alone covers the last fifty pages of the dictionary and makes navigating the wealth of information much easier. Also included are appendices which are quite informative. These are a *Chronology of Selected Events*, covering 1807 to 1993; *Diagrams of Government Agencies*, showing agencies concerned with personnel, ships, shipping, and regulation of each; *Principal Maritime Labor Unions and Business Groups* (by date of founding) from 1875 to the present; and the appendix that is almost as valuable as the rest of the book, the *Bibliographic Essay*, covering such topics as "Government Publications," "Government Legislation and Public Policies," "Business," "Labor," "Ships," and "Marine Propulsion and Technology."

The shortcomings of this work are few — mostly of omission rather than commission — and in no way detract from the usefulness of the information and the effort put into compiling it. It is an excellent reference work that fills an informational void and should be acquired for any library dealing with maritime studies.

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DAVID H. ROBERTS, TRANSLATOR. JEAN BOUDROIT, *The History of the French Frigate 1650– 1850* (Rotherfield, East Sussex: Jean Boudroit Publications, 1993), 12½" x 9½", 416 pages, 160 contemporary illustrations, 75 black and white photographs, approximately 150 drawings and plans by the author, a complete list of French frigates, index. £70.00 (UK).

David H. Robert's enterprise of translating Jean Boudroit's impressive works from French into English has moved from strength to strength through the past several years. The English editions he has produced are a godsend for anyone interested in naval history, and particularly so for students of naval architecture. My own first Boudroit experience came with the purchase of the four-volume set of *Le Vasseau de 74 Canons* from the now defunct Francis Edwards bookstore in Marylebone, London. With minimal competence in French, and none at all in its technical lingo, I used up several French-speaking friendships while digging through that four volume wonder during the following years. When David Roberts produced the English version, *The Seventy-Four Gun Ship*, it came into my library as "manna from heaven," and former French-speaking friends began to visit once again.

The successive Boudroit translations Roberts has offered, *John Paul Jones & the Bonhomme Richard, Schooner La Jacinthe, Cutter Le Cerf, Bomb Ketch La Salamandre, Xebec Le Requin*, the three frigate monographs: *La Renommée, La Belle Poule*, and *La Venus*, as well as the forthcoming, *The French 64-Gun Ship*, have provided the wherewithal for a thorough study of French warship design and done much to delineate the oft-romanticized differences between French, British, and Spanish ships-of-war during the wooden boat era. Were French ships bigger gun for gun? Did British ships carry too much metal for their size? Were Spanish ships the largest of all by rate? Questions like these represent the mere tip of the iceberg of European naval architectural historical inquiry. Much of the data required to resolve the answers to these and a myriad of other technical questions can be found in Roberts' translations. Through these and the works of Brian Lavery, Carla Rahn Phillips, David Gardiner, and others, the history of naval architecture has taken a significant step forward from the traditional works of John Fincham and other nineteenth century practitioners.

The History of the French Frigate 1650–1850 is everything one should expect from an author who is the world's leading authority on French wooden warships. Furthermore, the frigates themselves are the most fascinating vessel type descended from the age of sail — weatherly, speedy ships capable of carrying sufficient stores for lengthy independent cruises, or staying the rigors of dreary blockading work as Nelson's "eyes of the fleet." The tactical role frigates played ensured that they engaged the enemy considerably more often than their frumpy cousins, the ships of the line. Most frigate captains yearned for the autonomy of detached duty, and many of them made it pay, both for their country and for themselves, in a handsome manner. Intrepid leaders, the likes of Suffren for the French, Pellew for the British, and Stewart for the Americans, earned honorable reputations by the daring-do of their early years as frigate skippers. In the United States Navy, a small fleet of large frigates established traditions that live on today.

In frigates, arguably more than in any other type of warship, the actions of the commanders are inseparable from the technology at their command — a complex combination of wood, canvas, and cordage — in its entirety a floating gun-platform harnessed to a tactical purpose. It is this machine rather than its commanders which is the heart of *The History of the French Frigate*. Boudroit argues with considerable effect that the "modern" frigate of the type introduced into major navies during the eighteenth century was a French development; therefore, the history of the French frigate is the very essence of any study of frigates at large.

Until the advent of Robert Gardiner's *The First Frigates: Nine-pounder and Twelve-pounder Frigates, 1748–1815* (1992) and *The Heavy Frigates, Eighteen-Pounder Frigates: Volume 1, 1778–1800* (1994), frigates, despite their romantic histories, have not prompted the extensive studies that have illuminated ships of the line in recent decades. Gardiner's two published works and the forthcoming volume two of the second one, of course, address only those of the Royal Navy. For the Americans, Howard I. Chapelle discussed that nation's unique 44-gun frigates in his *American Sailing Navy*, but only as part of a larger naval universe. Thus, *The History of the French Frigate* is the first book in any language to attempt to piece together the entire story of frigate development.

Few writers possess Jean Boudroit's qualifications to discuss the technical side of naval history, and certainly no one can speak for the French as he can. His *Collection Archéologie Navale Française* encompasses twenty volumes. In the words of a recent reviewer, "the whole is a contribution to maritime history unequaled by any other scholar, or any other country."

Boudroit's present work is entirely new. It follows the evolution of the sailing frigate in the French Navy from its earlier beginnings to the age of steam. Each type is covered in its own chapter: the light cruisers of the seventeenth century, the 8-pounder class of the 1740s and 1750s, the 12-pounders of the French and Indian or Seven Years' War, and the much-admired 18-pounders of the Revolutionary and Napoleonic Wars. The study culminates with the 24- and 30-pounder frigates of the nineteenth century. The concluding chapter investigates all aspects of frigate evolution: sea ordnance, internal arrangements, masting and rigging, sails, carved-work, and decorations, as well as a review of the frigate model collection in Paris' *Musée de la Marine*.

While one might not be faulted for considering the book a narrow topical offering, *The History of the French Frigate* actually crosses a broad interdisciplinary spectrum and is considerably more valuable than a first impression might make of it. Practicing authorities, including naval architects, historians, professional model builders, and tall ship maintenance experts as well as amateurs, ranging from antiquarians through dedicated model builders, will find this and all the Boudroit books essential references for their interests.

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TIMOTHY R. WALTON, *The Spanish Treasure Fleets* (Sarasota, FL: Pineapple Press, 1994), 256 pages, illustrations, maps, glossary of Spanish terms, notes, bibliography, index. ISBN 1-56164-049-2. $24.95.

Of ambitious scope, *The Spanish Treasure Fleets* does credit to the topic and should appeal to a broad array of readers. In the course of six chapters, Walton makes a heroic effort to place the treasure fleets and the dangers they ran in the larger contexts of Spanish imperial history in the Old World and the New and of the growing global economy. He takes particular interest in the treasure itself, from mine to mint, and embellishes his story with rich numismatic detail and illustrations of Spanish coins. Many of the coins failed to enter the world economy, but rather sank to the bottom of the sea, to be found by twentieth century salvers whose achievements form a fascinating part of Walton's story and provide another source of evidence. About the elusive matter of coinage and the value of money in the period covered, he wisely sticks with the basic *peso* and its relative purchasing power, which he discusses in his preface. Also in the preface, he introduces five basic interrelated questions that he pursues through the book. His appreciation of the impact of Spanish treasure on the world economy, as American silver financed Europe's trade with Asia, is given graphic illustration in four maps of the Spanish Empire and the global flow of precious metals in 1550, 1590, 1700, and 1790.

Walton began writing his first chapter, "Conquest, 1492–1544," with a discussion of the relative roles of gold and silver in Europe and Asia, before going on to consider the means of maritime discovery and the ships of the explorers. He is brisk with the achievements of the conquistadors and appearances of pirates as American treasure first struck Europe. The involvement of Spain in European conflicts during the reign of its first Habsburg ruler, Emperor Charles V (1516–1556), intensified the demand for treasure as war drained the coffers. Maintaining its flow became a chief task of the system developed in Spain to administer its overseas dominions.

His second chapter, "Consolidation, 1514–

1580," starts with the find of the upper Peruvian mountain of silver, Potosí (now in Bolivia), and the techniques for mining it. He then turns to its transport and the organization of regular treasure fleets. His confusion of Don Alvaro de Bazán (d. 1558) with his son of the same name, the first Marquis of Santa Cruz, is a minor mistake. Regarding galley warfare, a serious student would gain a better understanding by reading J. F. Guilmartin, *Gunpowder and Galleys* (1974).

Chapter Three, "Ascendancy, 1580–1620," proves lively, although Seville, however rich, was not Spain's chief shipbuilding center; Spain's principal shipyards lay along the north coast. Walton treats the Armada of 1588 and related conflicts intelligently, although he des not place on his recommended reading list the best study of the topic, Colin Martin and Geoffrey Parker, *The Spanish Armada* (1588), to which he does refer in his notes.

In Chapter Four, "Decline, 1621–1715," Walton arguably begins the decline a bit early. Though a treasure fleet was captured for the first time by a Dutch fleet in 1628, the Spanish response of 1629–1630 was prompt and effective. However, the Caribbean became seriously out of control after 1640. The treasure continued to make the voyage despite significant interruptions. A second catastrophe overtook the treasure fleets in 1656–1657, when an English fleet captured a good part of the treasure off Cádiz and sank much of the rest in the Canaries; a third loss, also to an English fleet, occurred off Vigo in 1702. Walton handles nicely Spain's attempts to manipulate its coinage as part of its decline, and again follows the sliver eastward to Asia.

The period covered by Chapter Five, "Recovery, 1716–1791," finds the system of treasure fleets gradually dismantled in response to changed conditions. Great Britain had become the dominant power at sea, while Spain now allied with France, its historic enemy until the French House of Bourbon succeeded to the Spanish throne in 1700. Spain and France together, however, proved no match for Great Britain at sea, although they did prove instrumental in the independence of the United States. In the end, the great achievement of the treasure fleets for Walton was put into the global economy by what amounted to 80% of world silver production and 70% of gold production for the period.

In his final chapter, "Rediscovery, 1791–present," Walton follows the continuing saga of the *peso*, the subsequent mining of precious metals, and the gradual disappearance of gold and silver from currency. He also offers an informative account of the activities of modern divers, and a short list of treasure ships yet to be found.

His bibliography, limited to works in English, is extensive and impressive. For those who read Spanish, Caesáreo Fernández Duro, *Armada Española*, 9 vols. (1895–1930), carries much information, while José María López Piñero, *El Arte de Navegar en la España Renacimiento* (1986) proves useful for ships, charts, and navigation. For anyone wishing to follow Spain's Atlantic traffic for the relevant period ship by ship, see Pierre et Huguette Chaunu, *Seville et l'Atlantique*, 8 vols. (1955–1960).

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M. J. ROSS, *Polar Pioneers. John Ross and James Clark Ross* (Montreal: McGill–Queen's University Press), 9" x 6¼", xvi + 435 pages, 26 illustrations, 22 maps, glossary of place names, bibliography, index. ISBN 0-7735-1234-9. $34.95 (Canadian).

John Ross and James Clark Ross, uncle and nephew and both officers in the Royal Navy, are two of the best-known figures in the history of nineteenth century polar exploration. Between them, they mapped enormous areas of the Canadian Arctic, contributed greatly to the search for the Northwest Passage, mounted a determined (if fruitless) attempt at reaching the North Pole from Svalbard, played an important role (both practically and theoretically) in the search for the missing Franklin expedition, and contributed some of the first solid information as to the configuration and environment of the Antarctic.

John Ross led three expeditions to the Arctic (the last of them at the age of 73); on his second expedition (to the Gulf of Boothia, 1829–33), he amazed the world by emerging from the Arctic after four years, having abandoned his ship and taken to the boats. His nephew James participated in eight expeditions to the Arctic (two of them under his uncle's leadership, four under the leadership of the great arctic explorer, William Edward Parry), and one expedition to the Antarctic. On the later expedition (1839–43), he made a major contribution in delineating and defining the size of the Antarctic continent and discovered such geographical features as the Ross Sea, the Ross Ice Shelf and Mt. Erebus. Probably, his greatest claim to fame, however, was his discovery near Cape Adelaide on the west coast of Boothia Peninsula, on 1 June 1831, of the North Magnetic Pole. In total, James Ross wintered in the Arctic ten times.

As the author points out in his preface, an earlier biography of the Rosses exists, namely, E. S. Dodge's *The Polar Rosses: John and James Clark Ross and their Explorations* (London: Faber and Faber, 1973), but as he also notes, it covers little more than those explorations. M. J. Ross' biography penetrates in much greater detail the family's background and the other professional achievements of the two men (as well as their peccadilloes and foibles). In this regard, the author (a retired Rear-Admiral, Royal Navy, and a great-grandson of James Clark Ross) has taken full advantage of his knowledge of the ways of the "Senior Service" and access to family papers to produce a full and entertaining biography of his ancestors.

This biography thus deals in refreshing detail with all the generally known features of the two men's lives: the circumstances and impact of John Ross' professionally disastrous decision that Lancaster Sound was closed to the west by a range of mountains, the "Crocker Mountains"; his lifelong feud, thereafter, with the influential John Barrow, Second Secretary at the Admiralty; his petty, even spiteful squabbles with his nephew on this and other matters, such as the degree of his own involvement in the discovery of the North Magnetic Pole. We also learn about other equally entertaining but less well known aspects of the two men's careers: John Ross' significant contribution in the area of early steam navigation; his financial difficulties, which even became politically embarrassing, in view of his position as British consul to Sweden; James Ross' persistence in courting his sweetheart Anne Coulman, even after her father had warned him off; the various bankruptcies of George Ross, James' father; or the way in which John Ross handled the drunken, mutinous crew of the ship which was supposed to escort his ship *Victory* on his second expedition at Stranraer.

It is evident that the author is very fond of both his famous ancestors: John Ross, the tough, irrepressible sailor, somewhat eccentric, sometimes petty, often exasperating, who was still capable of producing appealing watercolors of the Arctic, and James Ross, the capable scientist and superb navigator, whose triumphant Antarctic expedition should perhaps have been the culmination of his career.

The fabric of this biography is well crafted; we are told enough of the earlier history of the exploration of the Arctic and the Antarctic to set the scene for the various expeditions in which the Rosses participated and to link together their various expeditions. The text is augmented by a very effective series of sketch maps; details of coastlines are reduced to the essential minimum and tracks of ships and sledges are shown clearly. One might perhaps argue that the addition of shading on water bodies might have enhanced the clarity of these maps somewhat. This reviewer found no typographical or factual errors. In short, the author and McGill–Queen's University Press are to be warmly commended on producing a handsome and authoritative addition to the literature on the history of polar exploration.

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W. M. P. DUNNE, *Thomas F. McManus and the American Fishing Schooners* (Mystic, CT: Mystic Seaport Museum, 1994). Foreword by Erik A. R. Ronnenberg, Jr., x + 355 pages, photographs, plans, appendices of schooners designed both by McManus and others, and a summary of the American and International fisherman's races, maps, and index. ISBN 0-913372-69-2. $39.95.

Some fine writers and historians have covered aspects of the heyday of the American fishing schooner. Her life began in a unique period in the maritime history of the northeastern part of the United States. Fish were abundant, cheap, and a staple of the eastern diet. The coastal communities furnished an abundant supply of skilled fishermen. Shipbuilders were numerous and had the materials to produce good and affordable vessels. As the inshore grounds became crowded and the fleet ranged further from the markets, speed became important, both for preservation of the catch and to beat the competing fleet to the buyers. The combined fleets of Boston and Gloucester numbered as many as 700 vessels. These conditions resulted in the development of a vessel type unique to the area and probably more highly refined for her work than the famous clipper ships were for theirs. The American fishing schooner was a beautiful thing, pleasing to the eye in all aspects, and in its final form, highly efficient for her place in the economy.

Howard Chapelle brought us the history of the development of the American fishing schooner with an emphasis on plans and technical description. Albert Cook Church, N. L. Stebbins, Edward W. Smith, Jr., Gordon W. Thomas, and others have provided us with excellent photographs and a broad picture of the life of these vessels and some of the people strongly associated with them. Dr. Dunne gives us the picture as played out by the McManus family, starting with its roots in Ireland, and follows the story and all of the principal participants from the arrival of grandfather Charles in the United States through the schooner's remaining history.

The McManuses were a prolific family, and Dr. Dunne's highly documented genealogy may give the reader a feeling of trepidation. A family tree would be welcome for recalling to the reader the part played by each participant. However, his skill as a narrator, coupled with a bit of enthusiastic blarney, makes the story readable and enjoyable to those interested in both the schooner's social and maritime history. Dunne's story of the 1892 Gloucester 250th Anniversary Race deserves a place with our classics. The author lets no opportunity go by to emphasize that Irishmen were responsible for everything good in the development of the American fishing schooner, but he condescends to adorn wealthy contributors whose background might be questioned with some Irish clothing. Dunne substantiates the positions of the McManuses, particularly Tom, as those primarily responsible for the final perfection of the working American fishing schooner. This book is a welcome and important addition to the history of maritime America. Its design and execution is attractive, and its 9¼" x 10¼" size conveniently fits most book shelves.

The book is divided into sixteen chapters, the first dealing with the McManus family in the small Irish fishing port of Skerries and the second with their beginnings in Boston. Some interesting prints of Skerries and its environs are provided, but its location is not established geographically. Other sources were consulted to find it to be on the Irish Sea near Dublin. The other chapters bear the names of vessels playing a part in Tom McManus' career, which is not very convenient for a researcher. Also confusing to one seeking to follow a theme is the author's scattering of fragments of the McManus story throughout the book.

Charles McManus, grandfather of Thomas Francis, the subject of the book, was a sailmaker in Skerries. Apparently, he brought his trade to Boston in 1847. As the family expanded, many of the male members earned their livelihood from more than one enterprise, including those of sailmaker, grocer, barkeep, and fisherman. They were all industrious and productive and established themselves well above the common laboring class. Charles' son, John H. McManus, succeeded his father in the sailmaking business. He worked with manufacturers to improve the fabric and construction of sails, and was chosen by leading yacht designers to outfit the finest racing yachts of his time. John also developed a close and long-lasting friendship with Dennison J. Lawlor, a prominent builder-designer of fishing vessels, and the two no doubt discussed their related philosophies. In later years, Tom credited Lawlor with being his principal tutor in the field of naval architecture.

Members of the family engaged in many different trades but were never far from the water. As they prospered, they became owners of fishing vessels and thus seriously concerned with the boats' efficiency and safety. Yacht racing was a family sport; although Tom was not an enthusiast, he frequently crewed with his relatives and learned his way about in sailing craft. Tom became a fish dealer and landlord, but his real interest lay in improving the design of fishing vessels. Strangely, he hated to draw, apparently preferring to express his ideas in the solid form of a model. Eventually, his eagerness to learn led him to classes in yacht design and construction in the Boston public school system, taught by John Frisbee, a practical shipbuilder. This may have been the first formal educational program in naval architecture in the United States. The first vessel built to a design prepared by Tom was the schooner *James S. Steele*, launched in 1891. He then went on to gradually increase relative draft and rake of the keel, eliminate the bowsprit in the so-called knockabout model, and improve stability and seaworthiness of the type. He continued his work through the end of the sailing schooner period, doing some of the first self-propelled draggers, several pilot boats, and several yachts. The author credits him with being the designer of nearly 290 vessels, and in the later days of the sailing fishermen, most of those still in operation were of his design. The last vessel from his board was the schooner-yacht *Sirod*, built in 1936. He died in 1938 at the age of 82.

After wading through Dunne's plaudits, the reader reaches the end of the book slightly mesmerized by the images of Thomas F. McManus and his fellow Irishmen. Any biographer painting this subject as possessed of superhuman talent must expect questions. It is necessary to withdraw from the magical aura created by the author in order to see Tom McManus and his work in a more realistic light, without diminishing the value of his contribution to the welfare of our fishing fleet. We must know more about McManus' education and the development of the theories on which he came to rely.

Dunne does not tell us very much about McManus' reading habits or his library. We are not given details of his technical schooling, but it no doubt consisted mainly of instruction in drafting and the simpler calculations usually assigned to an apprentice. He was in school in 1889 and apparently through 1890 and 1891. Although he had not worked as a shipwright, he had an extensive exposure to the trade.

Edward Burgess, who succeeded D. J. Lawlor as a designer for the McManuses, died July 31, 1891. He had no doubt influenced Tom's thinking, as had Lawlor. The latter died in January of the following year.

In 1902, Tom left the fish brokerage business in which his brother Charley, probably the foremost maker of both yacht and commercial sails in the east, was a partner. Tom apparently drew sufficient income from rental properties, interests in fishing vessels, and family enterprises to enable him to embark on a career in naval architecture, even though his chosen field was depressed through 1898. He received few commissions before 1901.

The earlier types of fishing vessel, such as the pinky, were good sea boats, but small and slow. The schooner was the most popular sailing rig (the hull form showed characteristics of European types), comfortable at anchor or hove-to, and conservative in performance. As the demand for fish increased and modelers sought speed, they created longer hulls. However, they were slow to increase the breadth and depth, and actually reduced the drag, or rake, of the keel, which had contributed to weatherliness. Being accustomed to risk, the fishermen tolerated the hazard of capsize until losses of vessels and life became too great to ignore. Draft limitations made the Gloucester fleet slow to adopt proportions that were known to improve dynamic stability. While not so restricted, the Boston fleet apparently accepted this limitation, believing that it was necessary for competitive speed. Joseph W. Collins, an ex-fisherman employed by the U.S. Fish Commission, wrote for the "Cape Ann Advertiser" in 1882, advocating improvements in design of the contemporary fishing vessel. Dennison J. Lawlor took up the cause and gave intelligent technical advice on how the known faults could be corrected. Dunne credits McManus with being a leader in improvement of the seaworthiness of the fishing vessels, but the movement actually started nine years before he sold a design.

The author tells us nothing of the calculations made by McManus to prove his designs. Lawlor's writings, as described by Howard Chapelle, show a good understanding of the principles affecting stability. Possibly, he aided in imparting such knowledge to McManus, but we are not told this. The amount and distribution of weight is a most important factor in both stability and proper sailing, but all that we learn from Dunne is that inside ballast of stone, iron, or a combination of both was common, and that outside ballast was employed on a few vessels. McManus was apparently surprised and angered when a number of his designs did not trim at launching as he expected. Possibly, Tom had expected the builder to install ballast for this event, but it would be natural for a builder to keep a vessel as light as he felt safe. All of McManus' early designs seem to have lacked static stability and carrying capacity, but Dunne accepts this as having merit. L. Francis Herreshoff in "The Common Sense of Yacht Design" states that the typical fishing schooner had too light a displacement for her length and sail area and was readily outsailed by a properly ballasted yacht. We know that the fisherman had a problem in trying to perform well, whether going to sea with salt or ice or returning with one of these crude preservatives and varying quantities of fish, but this is not discussed. The Lawlor-designed schooner *Harry L. Belden* entered and won the famous Gloucester race of 1892 the morning after arrival in port, and carrying 80,000 pounds of iced fish.

The story, which McManus apparently enjoyed telling, of the argument between himself and D. J. Lawlor over the relative speeds of an immersed duck with and without its neck extended illustrates a controversy that goes back to at least 1780. McManus claimed that the retracted neck resulted in a convex waterline which produced superior speed. This hypothesis may well have been debated in the stimulating atmosphere of a Boston pub.

The *Henry Ford*, probably McManus' crowning achievement, was both a beautiful vessel and designed for speed. Unfortunately, she became the victim of a ridiculous racing measurement rule devised by yachtsmen.

The rig of the American fishing vessels has been much criticized and would certainly never have been popular with European skippers with their smaller crews. The huge mainsail gave her most of her power, and no North American skipper dared to risk being beaten by his rivals through experimenting with a safer and more easily handled distribution of area. McManus bragged about his reduction in the size of the foresail, an action that actually exaggerated the size of the main. Schooner yachts of that period were similarly rigged.

There is no question that McManus' designs improved as he gained experience, and we are not aware that any failed. However, he was in an ideal position to learn by observation. He did not have to design ships for a living and, therefore, had time to develop his ideas based on experience with his family's vessels and those owned by others. Tom had little competition. There was very little demand for the services of independent designers of commercial craft, and the remuneration was so poor that few naval architects were interested in this field. Many shipbuilders gave away their designs as part of a contract, and owners were often reluctant to pay for such a service.

Some of the questions emanating from this story may never be answered.

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LYALL CAMPBELL, *Sable Island Shipwrecks: Disaster and Survival at the North Atlantic Graveyard* (Halifax, Nova Scotia: Nimbus Publishing, 1994), vi + 200 pages, illustrations, notes, index. Paper. $16.95.

Many places have laid claim to the sobriquet "Graveyard of Ships," but perhaps none were more feared by mariners than the isolated geographic anomaly off the coast of Nova Scotia known as Sable Island. More than thirty years ago, while working on a history of Sable Island before Confederation for his Master's thesis, Lyall Campbell developed a consummate interest, not only in the island and its ongoing courtship with maritime disasters, but with the daring men and women, lifesavers and victims, whose fates were forever shaken by their contact with it.

Proclaiming it was not his intention merely to chronicle the three hundred or so shipwrecks claimed by the island, or the life saving service known as the Sable Island Establishment which was founded because of them, the author has instead presented a narrative of the shipwrecks based upon their historical importance and the inherent appeal of their stories. Though he states that his aim is to engage the general reader rather than the scholar, the work is nevertheless scholarly, well footnoted, and illustrated with maps, contemporary drawings, and photographs that portray the more notable events and individuals depicted in the text.

This book, attractive in design and layout, is not simply a litany of disasters as are many shipwreck books. Instead, the author skillfully weaves the calamities that transpire into the fabric of the more historically relevant events of the era. Yet, he rarely leaves the island, except to provide a glimpse of mainland politics and bureaucracy inherent in founding and maintaining a humanitarian endeavor such as the Establishment. His focus is almost entirely upon the ever-migrating island itself, its victims, and its all too human resident lifesavers.

Beginning with the destruction of the *Delight*, one of Sir Humphrey Gilbert's ships of exploration destroyed on the island during a storm in 1583, and concluding with the loss of the Norwegian steamship *Heimdal* stranded in 1910, an event which resulted in the first use of the island's Marconi Radio, the reader is treated to a spectacle of struggle against the sea, replete with tragedy, triumph, and high drama. Campbell, however, has placed the events in human perspective with excellent first person accounts provided by seafarers, castaways, salvors, politicians, soldiers, speculators, and the hardy characters who faced disaster on an everyday basis, the lifesavers themselves.

As early as 1625, Johannes de Laet described Sable Island as "Having a bad reputation for shipwrecks." By the mid-eighteenth century, it had indeed gained the unenviable distinction of being the premier ship killer on the northeast coast of North America owing to its proximity to colonial shipping lanes and offshore fishing banks. Shipwrecks were frequent and marooned castaways were faced with survival on an uninhabited island devoid of trees and shelter, and entirely exposed to the elements. With the nearest settlement being the port of Canso, nearly 200 miles away, survival was as much a matter of good fortune as it was of ingenuity and courage. Untold numbers did not make it. Ironically, it was the baser objectives of land speculators, using the need to save human lives as motivation for settlement, that brought the first permanent human occupation to the island.

Campbell's selectivity in his accounts of the early shipwrecks are as reflective on the genre as they are of the specifics of the awesome total of vessels lost on the island's wicked shoals. Among selected accounts chosen for presentation, he tells us of the tragic loss of the *Catherine* in 1737, carrying over two hundred immigrants, and of the French corvette *Leger*, belonging to the ill-fated fleet of the Duc d'Anville, driven ashore in 1746. There is the tale of the *Francis*, lost with the personal belongings of the Duke of York, Prince Edward, an event which ultimately generated the first serious movement for the establishment of a life saving service on the island. Yet, no story is related simply for the purpose of shock value, nor are all the characters noble.

The efforts of Sir John Wentworth, founder of the Sable Island Establishment (forerunner of the Canadian Coast Guard), to move the bureaucracy forward to save lives and property, and of heroic James Morris, first Superintendent of the Establishment, to erect a viable settlement on the cold, inhospitable island shore while, at the same time, rescuing people from certain death, are told with erudition and few unnecessary adjectives. Unexpected characters of history and notoriety traverse the pages of the Sable Island saga with regularity: Dorothea Dix, who was so impressed with the life savers of the island that she donated the latest in lifesaving technology to their cause; the famed Canadian author Thomas H. Randall, who spent a year of his youth working the new Marconi unit; "The Rogue" Superintendent Joseph Darby, bemedaled by the King of France and termed "a paranoiac who had dreams of absolute control of Sable" are but a few. Sadly, the roster of the men of the Establishment, and their wives and children, who also worked, struggled, and suffered as hard as any to save lives without the benefit of compensation, are little remembered today, but their service was extraordinary. Living in often near squalid conditions, cut off from civilization except for the occasional supply boat, separated from each other by miles of sand dunes and a mid-island lake, and often obliged to put up scores, even hundreds of castaways in their own tiny homes until help came, they were indeed an exceptional lot. Campbell, in this fine work of creative history, has done them and the island justice.

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HILARY STEWART, *Indian Fishing: Early Methods on the Northwest Coast* (Vancouver: Douglas & MacIntyre), ISBN 0-2959-58030. $19.95

Anyone with an interest in fishing and maritime cultures will welcome the reprint of this richly informative and lavishly illustrated book. Apart from its new cover, which beautifully illustrates the fishing arts and technology of the Northwest Coast and a brief author's update, the volume is unchanged from its earlier printing. This is appropriate in a work that encapsulates its subject so well.

The book is divided into seven major sections. The introduction entitled "People of the Sea" describes the environment and traditional cultures of the Northwest Coast. In a few brief pages, Stewart clearly conveys the importance of fishing and the intimate relationship between the people of the region and the sea on which their lives depended. The following four chapters focus on different fishing techniques, including hook and line, spearing, netting, and the use of fish traps and weirs. Each describes and illustrates the form and manufacture of the related technologies, but the objects are also brought to life through vivid descriptions of fishing, which evoke clear images of people and places. Most descriptions are drawn from the author's own experience, but some passages are taken from the journals of early explorers and traders. Native informants are also given a voice to describe their ways of fishing and beliefs about fish and the sea. Stewart so deftly integrates stories, descriptions, and illustrations that scholars will find themselves caught up in the stories, while casual readers may find themselves unexpectedly involved in the intricacies of fishing gear manufacture.

The penultimate chapter moves away from a focus on catching fish to the equally, if not more important, tasks of preparation and preservation. The techniques are no less ingenious, and the format of the descriptions and illustrations remains the same, but this chapter is an important change in focus that begins to illustrate the full role of fishing in the lives of the Northwest Coast peoples. The methods of butchering, smoking, drying, and rendering, and the quantities of food prepared by these methods clearly show the vital importance of fishing in people's daily lives. This chapter also gives a much more prominent role to women, and fully integrates the fishing enterprise within family and community relationships.

The final chapter, entitled "Spiritual Realms," is a major departure from the rest of the book. Stories, prayers, and elaborate artistic expressions are combined with descriptions of First Salmon Ceremonies and other rituals. These help to emphasize that fishing was much more than just a means of acquiring food.

The book combines ethnographic collections, personal observations, archival material, and the results of archaeological excavation to tell a very personal and highly readable story of a unique maritime way of life. Stewart has taken the objects from their usual museum settings and put them back into the hands of the people who made and depended on them for their living. She also takes the reader through her own process of discovery by describing visits to Native elders and her experiments with replicated fishing gear. In this way, she draws the reader into sharing her fascination and wonder at what she learns. This book's shape, faint sepia-tone pages, and black-line drawings with their hand-lettered captions are all reminiscent of an explorer's logbook and the attempt to chronicle adventures and discoveries to share with others unable to participate in the experience.

The book is as informative as it is evocative, but researchers seeking further information will be disappointed by the lack of references. Although the illustrations are all clearly referenced, textual sources are not always given. The narrative does not allow the reader to evaluate the information or to know in all cases whether ethnographic descriptions refer to the present or the near or distant past. As frustrating as this might be for some readers, it is understandable in a book that tries to give popular access to a subject that is too often restricted to technical and sometimes dry ethnological works. In the end, it achieves a balance of academic content and popular presentation that can be appreciated at both levels, though general understanding takes clear precedence over critical analysis.

One obvious flaw in the book is its title, which unfortunately retains the disparaging term "Indian." Although Stewart acknowledges that this is a misnomer, no longer in use, the publishers, by not adopting an alternative, have contributed to the perpetuation of the term that many Native North Americans find offensive. This is particularly unfortunate in a book that in every way celebrates a traditional native way of life.

This book will be enjoyed by many for many different reasons. In addition to its colorful depiction of a technology that has largely, though not entirely, disappeared, and a way of life that has undergone tremendous change, it also paints an alternative vision of the world. At a time when industrial fishing is rapidly depleting fish stocks worldwide, this book is a reminder that the right combination of technological ingenuity and respect for the sea and its resources can support a rich and sustainable way of life.

AUBREY CANNON

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DIANE NEWELL, *Tangled Webs of History: Indians and the Law in Canada's Pacific Coast Fisheries* (Toronto: University of Toronto Press, 1993), 303 pages, index, photographs.

The picture presented in this book of the increasing marginalization of Indians[*] in the Canadian coast fishery is depressing. No less depressing is the author's characterization of every government law, policy, or program as ineffective, wrong-headed, or designed to ensure Indian marginalization. The rays of hope identified in this book are the spirit and inherent resource-related common sense of the Canadian West Coast Indians and a Supreme Court of Canada decision recognizing as a constitutional principle an aboriginal right to fish.

The author's central argument comes simultaneously from the clarity and uncertainty created in the 1990 decision of the Canadian Supreme Court in *Regina* v. *Sparrow*. Following changes made to the Canadian Constitution in 1982, section 35(1) recognizes as a constitutional principle aboriginal people and rights. *Sparrow*was the first case to interpret judicially Section 35(1). While the Court held that aboriginal rights could be extinguished by Crown action, they held that decades of complex fisheries regulations explicitly had not extinguished the aboriginal right to fish. The Court determined that the aboriginal right to fish was a priority that had to be satisfied *before* allocations were given to other resource users. The facts and arguments in the case concerned the aboriginal right to a food fishery (harvesting for personal consumption and ceremonies), as opposed to an industrial or commercial fishery (sales to non-Indians). Clearly, if the aboriginal right to fish extends to include commercial uses, then the allocation of resources to Indians will be significantly greater and cause more conflict with other users than if the aboriginal right involves only the food fishery.

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[*] *Indians, as opposed to Natives or Aboriginal Peoples, is the term employed by Diane Newell in the book under review and will, therefore, be employed by the reviewer.*

Through a detailed history of the declining participation of Indians in the British Columbia fishery, the author attempts to illustrate that the Indians at no time conceded or stopped believing in their inherent right to fish. While the evidence that either the Indian communities or the Government of Canada viewed fishing in terms of a right is uncertain, the issue has been resolved favorably by the aboriginal rights section of the Canadian Constitution and the *Sparrow* decision.

What *Sparrow* has not resolved is whether the aboriginal right to fish includes an industrial or commercial fishery. Professor Newell has attempted to provide the historical evidence to answer this question. Curiously, at no point does she state explicitly her conclusion, although it is clear that she feels the evidence exists to support an industrial fishery as part of the aboriginal right to fish. She presents much evidence that the slow removal of Indian communities from fishing activities was due to outside forces, such as market economics, law, and government policies, rather than an abandonment of commercial interest by the Indian communities.

The Canadian constitution and the case law interpreting the relevant provisions provides that the federal government has the primary responsibility regarding the harvesting of fish, and the provincial government has jurisdiction over processing plants. The federal jurisdiction is tied to concepts of resource conservation and management. The mythology is that the federal government's primary concern in fisheries regulation has always been appropriate resource conservation, and that they have operated as a neutral mediator among the conflict user groups (Indians, processors, sport fishers) and segments of the industry (seiners, trollers, gill-netters). Professor Newell depicts a history of government action which conflicts with the above image. Too often, she argues, the federal government played favorites inevitably to the disadvantage of Indian interests. Moreover, the conservation mandate was abused to favor commercial interests over Indian community interests and, by the alleged depleted state of much of the West Coast fishery, the conservation mandate was poorly executed. The historic failures of the federal government are relevant in the 1990s, since defining and giving effect to the aboriginal right to fish requires cooperation between Indian interests and government interests, but the legacy of mistrust has to be overcome.

As a neophyte respecting history and aboriginal rights, the reviewer is reluctant to be critical in any substantive way. Dr. Newell's description of one of her colleagues as "an ungenerous scholar who is out of touch with his rapidly evolving field," the validity of which the reviewer knows nothing about, also dampens one's enthusiasm to be critical. One impressionistic quibble, however, may be appropriate.

The impression left the reader by Professor Newell's book is that *nothing* the federal government has done in this century regarding the fisheries has benefitted or protected Indian interests. Special programs have been too little, too late, wrong-headed, benefitting the wrong groups or undertaken for the wrong reasons. In one case where it appeared that Indian fishers were doing well, the high proportion of Indian fishing on the Nass and Skeena rivers in the mid-1970s, it was the wrong Indians benefitting — off-reserve Indian fishers from Vancouver rather than local Indian communities. In other situations, enhancement of successful Indian fishers rather than Indian community interests is the basis of criticism of government policy. Is it possible that *nothing* has been done right or with good intentions? The answer may be that Professor Newell is correct that every opportunity and option chosen was a negative one for Indian interest, but it does create a credibility problem for this reader.

The way forward in dealing with aboriginal fishing rights on Canada's west coast is far from clear. The *Sparrow* decision has affirmed the right to fish, but how this is to be implemented is uncertain. Moreover, land claim negotiations will inevitably involve fishing rights, since the federal government has jurisdiction over fish while the provinces have jurisdiction over land, and the federal level appears to be less intransigent than the British Columbia government which can be expected to use fishery resources as a bargaining chip. However murky the future of Indians and fisheries law and policy, Professor Newell has written a readable and compelling chronicle of the past interaction of fisheries law and policy and Indian lives and rights. The above noted impressionistic quibble notwithstanding, the book deserves a wide readership.

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EDWARD J. MAROLDA, *By Sea, Air and Land: An Illustrated History of the U.S. Navy and the War in Southeast Asia* (Washington, DC: Naval Historical Center, 1994), xvi + 416 pages, maps, illustrations, photographs, appendices, glossary, bibliography, index. $43.00.

Over the last few years, books relating to the fiftieth anniversary of World War II have crowded bookstore shelves. At the same time, however, the number of books appearing on the Vietnam War have hardly diminished. One of the newest books published is Ed Mardola's *By Sea, Air, and Land.* As its subtitle indicates, it is a richly illustrated account of the U.S. Navy's participation in that long and bitter conflict.

The author heads the Naval Historical Center's Contemporary History Branch. An Army veteran of the Vietnam War, he has authored or coauthored several works on various aspects of that war. Thus, he is highly qualified to write this new addition to the historiography of the war. As Mardola points out in his preface, the Navy's role in the conflict was not centered just on South Vietnam, but encompassed a tremendously large geographic area ranging from North Vietnam, Cambodia, and Laos to the Philippines and bases throughout the Pacific. Of course, the waters off both Vietnam, Cambodia, and Thailand were almost totally controlled by U.S. naval forces.

Mardola's account of the war is concise and succinct. In just five chapters, he generally follows a chronological trail, beginning with the arrival in Saigon of a U.S. Military Assistance Group (MAAG) in August, 1950, and ending on May 2, 1975, with the fall of South Vietnam and the removal of the last of a flood of refugees from that war-town country.

Early activities in Southeast Asia from 1950 to 1959 are described in a short first chapter. Although U.S. naval vessels made several "show-the-flag" visits to Saigon in the early fifties, and were prepared to assist the French during the battle at Dien Bien Phu (President Eisenhower decided the risks outweighed the gains for such an action), it was not until mid-1954 that the U.S. Navy played a significant role in Vietnam. From August 1950 through May 2, 1975, the Navy sealifted almost 300,000 Vietnamese and Chinese who wished to leave what was then North Vietnam for South Vietnam.

The author moves on briskly in Chapter 2 to cover the period 1959 to 1965. During this time, the North Vietnam leader, Ho Chi Minh, instigated a series of actions in South Vietnam and Laos intended to overthrow both these two countries. Three times, from late 1959 until the spring of 1961, the Navy mounted several shows of force intended to persuade the Communists to cease their activities, and also to reassure the Laotian and South Vietnamese governments.

Initially as part of MAAG and later as part of the Military Assistance Command, Vietnam (MACV), naval personnel were actively involved in South Vietnam as advisors to the Vietnamese Navy. Additionally, the U.S. Navy provided small craft and training in counterinsurgency operations to the Vietnamese. These counterinsurgency activities soon extended into North Vietnam and Laos, with U.S. Navy personnel maintaining the boats used in these operations, as well as continuing the training of the South Vietnamese. After describing briefly the increasing U.S. involvement in South Vietnam during the turbulent years of 1951–1963, Mardola takes a look at the crucial Gulf of Tonkin incidents and the creeping escalation of the conflict growing out of these incidents. As the chapter ends, certain operations that later became very well known make their first appearances — operations such as Rolling Thunder and Barrel Roll.

The next two chapters (comprising almost two-thirds of the book) form the book's core, carrying the conflict from early 1965 until the spring of 1973. With the South Vietnamese government crumbling under the dual onslaught of military and political actions by the North

Vietnamese, President Johnson raised the stakes in Southeast Asia in 1965. More U.S. troops were sent to the region, and combat operations now reflected a change from attempting to dissuade the enemy with relative small-scale actions to instead hurting him and destroying his facilities with massive attacks.

Aircraft from carriers stationed in the South China Sea at a point named Yankee Station often led the way in these attacks. (Another launch area located farther south, Dixie Station, was used in 1965 and 1966.) From Yankee Station, the Navy planes fanned out to attack targets all over North and South Vietnam and Laos. However, carrier operations made up only a portion of the Navy's many tasks in Southeast Asia. Other jobs detailed by the author range from the mundane but extremely important mission of logistics support to civic actions to coastal patrols during the Market Time operation. Riverine warfare, which saw some of the roughest fighting of the conflict, was seldom publicized because of both the more photogenic carrier operations and the nature of the work. This warfare also receives a very nice treatment by the author.

The enemy's 1968 Tet Offensive led the Johnson administration to drastically rethink its Vietnam policies. Although the reality of Tet was a staggering defeat of the Communists, the American public's perception of Tet was that it had been the U.S. and South Vietnam that had been defeated. Ever the consummate politician and sensitive to public opinion, Johnson ordered a gradual withdrawal of U.S. forces from Vietnam. Thus, America began its pull-out. Mardola's fine prose captures the valiant efforts of the Navy to make the enemy pay dearly during those last years of the war. The SEALORDS campaign, the Vietnamization of the war, the mining of Haiphong, and the subsequent minesweeping efforts by the Navy during Operation End Sweep are subjects typical of the Navy's wide-ranging role in the war and are well told by the author.

A final chapter recounts the last chaotic months in South Vietnam as the United States pulled its forces out of the country in a dramatic and painful evacuation of the last Americans and many South Vietnamese. *By Sea, Air, and Land* also includes excellent appendices, aircraft tailcodes, and who shot down enemy aircraft and the dates of these shootdowns.

By Sea, Air, and Land is a very readable, highly visual (the author chose all of the illustrations) book. It is not an analytical tome, full of recriminations or, conversely, paeans of the Navy. It is a straightforward accounting of the U.S. Navy's role in the Vietnam War, a role in which the service acquitted itself with distinction. For anyone who has an interest in the history of that war, it is a volume that will make a fine addition to his or her bookshelves.

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HAROLD S. SNIFFEN, *Antonio Jacobsen's Painted Ships on Painted Oceans* (Newport News, VA: Mariners Museum, 1994), xii + 163 pages, more than 120 illustrations, many in full color. Cloth, 9" x 11". ISBN 0-917376-41-2. $75.00.

Harold S. Sniffen has spent a good deal of his career studying, with great care, the work of Antonio Jacobsen, just as Jacobsen spent his documenting the sail and steam vessels that frequented New York Harbor from the time he arrived in this country from Denmark in 1873 until his death in 1920.

What emerges from Mr. Sniffen's biography and critical survey of Jacobsen's work is a portrait of a man whose passion for ships is chronicled, not in words or anecdotes of artistic bravura, but rather in an astonishing body of work. As Mr. Sniffen points out, there are those who might argue that a photographic chronicle could serve as well as Jacobsen's rich record, but for many reasons that argument falls short. Freezing in focus the action of ships in motion at sea on slow speed photographic plates or film was next to impossible in Jacobsen's day. Color photography as it is known today did not exist, and most photographers did not venture outside their studios. Significantly, as Mr. Sniffen notes, "roughly one third of the ships he painted are not otherwise represented.... Jacobsen, therefore, preserved the likenesses of several hundred vessels that may not have been recorded for posterity by any other means, earning him his place as an effective maritime historian."

What is most compelling about the record Jacobsen left is not the fact that it is maritime history. Rather, it testifies to the artist's insistence on capturing for himself, as much as for posterity, something for which he had a great passion. Though that passion may have worn thin at times, when the burden of a similar subject in the same medium and so often commissioned came over him, it is clear in what Mr. Sniffen calls "a lament" found among Jacobsen's papers and signed by him that the artist's feelings for ships never left him, in spite of the burden of his reputation. Although he was mourning the passing of the clipper ship, the poem speaks to Jacobsen's inner life. "Gone is the clipper, with her studding sails....Gone the tribe of peerless mariners that fretted the utmost seas with her spurning keel....No more the painted ship on a painted ocean remains....Still that painted ship is a challenge...to a nation...to remember its sea heritage...which it once risked its very existence to establish."

Mr. Sniffen's beautifully designed book brings Jacobsen's work to life in the way good design can be — the positioning of details alongside full paintings, the use of pencil sketches to bring out the structural underpinnings of a painting, the use of the motif of several pages of a sketchbook placed side by side — give a sense of how the artist worked. In a body of work like Jacobsen's, to see the *plein air* sketches and studies reveals the artist. Although Mr. Sniffen describes the man, his task is not an easy one. Perhaps the fact that Jacobsen charged but five dollars for a painting throughout his career is revealing. Then again, such is the way of artists; they often sell themselves short.

Turning to the excellent reproductions, especially of the sketchbooks, is necessary; in them, we see more of the artist. Although he economized, squeezing his preliminary sketches into the fewest number of sheets in his sketchbooks (he drew them hastily), he "paused lovingly" over the stern. "It was necessary," Mr. Sniffen comments, "but this self indulgence [makes] the sketches all the more appealing." Mr. Sniffen tells us how much Jacobsen valued these sketchbooks — on the first page of one of them, Jacobsen wrote, "If this book should be found please return at once to Antonio Jacobsen...and a reward of $2.00 will be paid on delivery."

Any lover of the sea will pause lovingly over the pages of the book because, over and over, in seas, skies, and ships, that feeling is affirmed. Take a moment to contemplate the painting *Harvest Queen*, for example, showing the 1872–built *Adriatic* in the misty background and the lifeboats pulling away from the distressed ship, the ragged tear in her side like an open wound, the sea crested in an eerie yellow light, the sky as eerie. If it is rough water you like, pause a moment over *City of Berlin*, awash in sky and sea, or imagine being aboard the *City of Rome*that day when the sky was as black as her hull. Let Jacobsen take you back to Point Pleasant, New Jersey, a rough piece of coast in spite of its name, on February 12, 1900, when the *County of Edinburgh* ran aground, or to the America's Cup race between the American cutter *Volunteer* and the British challenger *Thistle*. Although, as Mr. Sniffen points out, Jacobsen was not often drawn to as calm and as reflective a scene, his painting *Vandalia* conjures up the serenity of dawn, with a magnificent vessel anchored in the pink light of sunrise.

As the Age of Sail becomes a memory, and the Age of Steam recedes, Antonio Jacobsen's work becomes essential. Certainly, his *oeuvre* will fascinate generations to come. *Antonio Jacobsen's Painted Ships on Painted Oceans* belongs in the library of every maritime enthusiast. We ought to be grateful to Mr. Sniffen as well; he is a scholar of the highest order and a man of quiet passion, like his subject.

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Ira Dye, *The Fatal Cruise of the Argus: Two Captains in the War of 1812* (Annapolis: Naval Institute Press, 1994), 368 pages, bibliographical references, index. ISBN 1-55750-175-0. $35.00.

The principal fictioneers of naval history, from yesteryear's C. S. Forester to today's Patrick O'Brian, unfailingly entertain and are justly praised. Yet, for this reviewer at least, the lives and deeds of real-life characters can make for more satisfying reading. Here we have a good example in this well researched, three part tale featuring an American naval officer, William Henry Allen, who, had he survived beyond youth, might have won for himself the sort of glittering niche in the annals of the fledgling U.S. Navy occupied by Hull, Porter, and Decatur. Our interest in Allen's life story is sustained even as, at the outset of Part Two (and justifying the book's subtitle), we are introduced to the Englishman destined to cut that life short.

The son of a Revolutionary War major who wished a peaceful civilian occupation for him, Allen felt otherwise and joined the Navy in 1800 at the age of fifteen. Trafalgar was fought on his twenty-first birthday. For the young lieutenant, that coincidence might have proved no omen of Nelsonian renown — he was just then a protégé, on Mediterranean service, of John Rodgers, that bellicose commodore from whose grasp seagoing glory would repeatedly slip. Two years later, however, Allen was one of six lieutenants aboard the U.S. frigate *Chesapeake*, under command of an old Rodgers foe, James Barron, whose hapless performance that melancholy 22 June 1807 off Hampton Roads gave Allen the first chance to show his mettle.

Though the two nations were not at war, the British ship *Leopard* had intercepted the American vessel and demanded the surrender of alleged British subjects among her crew. When Barron hesitated to respond, the *Leopard* fired across the *Chesapeake*'s bow, then her stern, then sent broadsides through her masts and onto her hull. With a blazing coal from the galley, Allen fired the only gun in response. Giving due notice to his "inspiration that led to the only defense of American honor that day" (page 63), Ira Dye good-naturedly acknowledges that, contrary to myth, the lieutenant may not have actually carried that honor-saving red-hot nub in his bare hands. Dye also, in commendable fairness, concedes that Barron's bitter assessment of Allen as "vindictive...with all of the prejudices that his friend Rodgers could inculcate" (page 67) may well have contained some truth.

Dye concludes that the *Chesapeake*'s ordeal under the *Leopard*'s claws left Allen with "a sense of deep distrust and cold fury toward the British Navy" (page 70). Perhaps. But, as it is demonstrated elsewhere in his account, this tall, handsome youth, something of a homebody and shy around girls, was an impulsive and tenacious fighter, as well as an expert in his craft. He was with Stephen Decatur, his "beau ideal of a naval officer" (page 75) during the War of 1812 engagement between the frigates *United States* and the *Macedonian.* Allen's "incessant gunnery training paid off: the shooting was so accurate, despite heavy seas, and so rapid were the gun flashes, that some of the crew on the British ship thought the *United States* had caught fire" (page 87). Little wonder that the *Macedonian*'s final body count was the highest suffered by a British frigate in a single encounter.

As overture to his narrative of the *Argus* under Allen's command, Dye devotes a fascinatingly detailed chapter to that diminutive but gun-bristling brig-of-war, a guided tour of the vessel from its forepart, with decorative figurehead and crew's toilets — "a couple of round holes in the top of open-bottomed boxes set on either side of the head, open to the sea and weather" (page 103), via berth deck and galley to "officers' country" (page 105). Allen took command of the *Argus* in February 1813. His first assignment was twofold; delivering a new minister to France, then to harass British shipping in the foe's home waters. Within a single summer fortnight in the English Channel and the Irish Sea, he savaged merchantmen, alone or in convoy, took off their crew, and burned or sunk the ships. His twentieth victim was the *Bedford*, relieved of her wine and silver cargo, then set afire. Those flames were sighted by Captain John Fordyce Maples aboard His Majesty's brig *Pelican.*

Dye's earlier chapters, which already

familiarize the readers with Maples, give a foretaste of the climactic confrontation and add suspense to his story. It was a one-sided match. The *Pelican* was larger and more heavily gunned than the *Argus*. In addition, Allen's men were dog tired. "Common sense and wise judgment should have led him to avoid battle" (page 276). The lighter ship could easily have escaped. Allen had boasted to his men that their vessel could whip any Englishman in ten minutes. To his adversary, however, "the *Argus* was the lucky break of a lifetime" (page 277). John Maples had long been overlooked for promotion.

The battle ended in less than an hour, leaving Allen fatally wounded, some of his men decapitated, his ship in tatters. Maples sailed home to an eventual promotion with high honors. In the United States, a naval court of inquiry blamed the loss of the *Argus* on crew fatigue (James Fenimore Cooper charged drunkenness). Dye acknowledges crew fatigue and inferior firepower, contending that Lieutenant Allen should never have taken on the *Pelican*, and his summing up of Allen evokes the image of a gallant sea officer whose "excessive sense of personal honor...brought him to his death" (page 287). On the other hand, this character trait — noted by Dye as common among American naval officers in the age of sail — with sometimes unthinking boldness, probably accounts for some significant American naval triumphs.

The British buried Allen with one of his fallen subordinates in a Plymouth, England, churchyard. A headstone reads: Here Sleep the Brave. Ira Dye gives us ample evidence of that bravery. Of broader importance, he has painstakingly re-created the historical setting for such display, at the same time breathing life into portrayals of William Henry Allen's contemporaries, friend and foe alike. His book deserves a place on any true naval buff's bookshelf.

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CHRISTOPHER S. MILLIGAN AND JOHN C. H. FOLEY, *Australian Hospital Ship* Centaur: *The Myth of Immunity* (Australia, Nairana Publications, 1993). 340 pages, illustrations, three maps, one color plate, hardcover, bibliography, notes, index, abbreviations list. ISBN 0-646-13715-8. $40.00 (Australian), $30.00 (US).

Australian Hospital Ship Centaur covers one of the more shameful feats of Japanese arms during the Second World War, the deliberate sinking of AHS *Centaur* off Brisbane on 14 May 1943. Doctor Christopher Milligan and Captain John Foley have written a definitive work on the subject.

The book has an unusual style, as it is a cooperative effort by a Queensland historian and a Canadian academic. This has resulted in an excellent and authoritative book, but one which reads much like a local history. Some of the wording is overblown, with unnecessarily emotional phrasing. There are a few errors of fact, such as ascribing the loss of HMAS *Canberra* to Japanese bombers (page 242), but nothing to seriously detract from the high overall quality. Indeed, the mixture of local history and academic styles has resulted in a very readable book free of most of the usual flaws of popular history.

The authors have been meticulous in their research. This reviewer has also researched the loss of *Centaur*, and information is widely scattered in Australian archives. The authors have their facts straight, and the book is well laid out with ample illustrations, including sketches of her internal layout before (page 4) and after conversion (page 40). The illustrations also include two excellent plates of the ship (pages 52–53).

The prewar history of MV *Centaur* is adequately covered, as are wartime activities prior to conversion. The decision to select and convert the ship is discussed in detail, as is the actual conversion itself.

A major strength of the book lies in chapters four to ten. This section covers the period from commissioning as a hospital ship, through her activities on the east coast of Australia to the sinking and rescue of the survivors by the de stroyer USS *Mugford*. Captain John Foley has spent many years in the merchant navy and has a deep familiarity with Australian maritime life. He interviewed some of the survivors and gained access to the personal correspondence and family records of others. The result is an intimate view into the actual life of the ship and her company, giving a fascinating and detailed insight into the activities of a wartime hospital ship, and her loss. The only notable shortcoming is not quoting the Australian protest (Prime Minister's Secret, Most Immediate Cablegram O.13401/13429 dated 19 May 1943) in full.

The identity of the Japanese submarine responsible for the sinking has been a contentious issue in Australia. The authors have conducted an exhaustive investigation. There is little doubt that they have identified the culprit and traced her activities. Her Commanding Officer was not punished for his action and died of old age in 1986. The investigative efforts of the authors seem conclusive, and the story of how the Japanese were able to protect the guilty parties is of considerable interest.

The main appeal of this book is to the reader interested in Allied hospital ships and Japanese submarine operations during the War. The book also has the attraction of the obscure for US readers, as Australian wartime history is not widely known in the USA. In summary, *Australian Hospital Ship* Centaur: *The Myth of Immunity* is an excellent, readable piece of maritime history well worth adding to your library.

This volume is available through the publisher: Nairana Publications, 6A Doncaster Street, Hendra, Queensland, Australia 4011. The price is $40.00 Australian via bank check or $30.00 US via registered mail. The price covers all handling and airmail postage to anywhere in the United States.

LIEUTENANT MARK L. BAILEY, RAN

Maritime Defense Studies
Royal Australian Navy

DEREK HOWSE ON BEHALF OF THE NAVAL RADAR TRUST, *Radar at Sea: The Royal Navy in World War II.* (Annapolis: Naval Institute Press, 1993), xx + 383 pages, illustrations.

This is a timely book. That praise has perhaps been weakened through overuse (often to describe narrow monographs that are *not* eagerly awaited); in this case, there is not a whit of exaggeration. Despite the flowering of research into naval operations of the Second World War in the last twenty years, and recognition, even exaggeration, of the importance of British naval radar, no detailed study of the subject has been available. The Royal Navy has prided itself as the silent service, and in this instance it is certainly true. Only Sir Arthur Hezlet's superb but general *The Electron and Sea Power* (1975) filled the gap. The Admiralty's confidential "Technical Staff Monograph," *Radar*, has been opened in the last few years. However, it is less full than the comparable army study and especially the Air Ministry's multi-volume "Signals" series. Neither have the sailors, engineers, and scientists of the Admiralty program shown anything like the propensity of their Air Ministry counterparts to produce memoirs such as E. G. Bowen's *Radar Days* (1987). That is until now, for the present volume was sponsored by the "Naval Radar Trust," a group of veterans of the Admiralty effort. The author, who himself served in the RN in 1939–45, has wisely drawn on the memories and technical expertise of the members of the trust and was guided by their advice in his fruitful searches in the archives.

Historians, since the opening of masses of official sources in the 1970s, have been able to penetrate to the tactical essence of operations in 1939–45. The contribution of radar has been one of the subtler and more interesting issues, not least because it was a cloudy one. The tendency of the "now it can be told" literature of the 1940s–50s to ascribe wonder weapon status to radar still has a long influence. Indeed, miracle properties ascribed to radar formed an important part of Allied security, as the release of "Ultra" intelligence files has revealed. Admiral Dönitz, commander-in-chief of U-boats, was systematically encouraged in his belief that wondrous radio location devices and not breaks into his communications ciphers accounted for Allied success against German submarines. In the case of the Battle of the Atlantic, many of the principal works of the 1970s and 1980s, such as Sir Peter Gretton's *Crisis Convoy* (1974), Jürgen Rohwer's *The Critical Convoy Battles of March 1943* (1977), and Marc Milner's *North Atlantic*

Run (1985) devoted considerable effort to determining precisely what radar was fitted in particular Allied warships, how well it functioned, and how important it was in comparison to other detection devices and intelligence of various sorts. These kinds of studies in turn provided a sharply focused lens for understanding and assessing navies and maritime states at war. The ability to develop quickly, manufacture, and intelligently operate high technology equipment in response to unexpected needs at sea was a decisive challenge to all levels of the fighting service, and to the national economy that sustained it.

Derek Howse, although succeeding in his goal of producing a straightforward account for the general reader about how British naval radar was developed and sent to sea, never loses sight of the larger issues. Admirably, he places operations and the response of the Royal Navy to operational experience at the forefront. The book is organized chronologically. Each chapter begins with a summary of the principal actions at sea and the resulting requirements that the naval staff laid down for radar development in that period. This is an excellent method for keeping the "real world" context constantly in view, and for treating, in their true relationship to one another, the full range of radar projects. These included navigation, long range, high altitude air warning, low altitude air warning, surface warning, gunnery direction (both surface and antiaircraft), and the vexed problem of coordinating covering fighters and ships' gun systems in defense against concerted air attack. Integral, equally complex projects such as changes in ship's internal organization, spaces, and equipment effectively to integrate radar information into combat systems, and the challenges of coordination with other services for combined operations also fall into place. In this way, the book gives a well rounded story for not only every type of British naval radar, but of significant modifications of each type. Tightly written passages and well-conceived tables supply valuable information as to when and how specific systems were actually fitted in ships. Battle vignettes in each chapter describe, with quotations from blunt after action reports, how well or badly the equipment worked. Discussions of technical concepts and special applications that would interrupt the narrative line have been extracted to forty pages of glossaries, tables, and appendices, including a strong account of radar in the Fleet Air Arm by David Brown of the Naval Historical Branch at the Ministry of Defence.

The book builds, through the wealth of detail, the central theme that radar, while not providing sudden miracle solutions to tactical problems, transformed maritime warfare in subtler, more profound ways. That change was best symbolized by the shift of the captain's fighting position from the open bridge, where he could smell the sea and the enemy, to an Action Information Centre below decks, where he was, ringed by radar scopes and plots served by specialists whose trades had not existed at the outbreak of war. Sir Arthur Hezlet made that same point, but the achievement of Howse and the Naval Radar Trust is to show vividly and precisely how it happened. The book also provides material for a second theme, the rise of the United States as the dominant naval power. Ingenious as Britain was in deploying scarce resources to meet unexpected crises, such as the fitting of compact RAF airborne radar in naval escorts and the crash development of centimetric radar to counter wolf-pack attacks by surfaced U-boats at night in 1940–41, by the latter part of the war the US had taken the lead, notably in the sophisticated height-finding radar required against mass Japanese air attacks in the Pacific. The frank discussion of the superior qualities of some American equipment, its importance in RN service, and the shortcomings of British programs is typical of the honesty and forthrightness of this book. It is a production of the first rank: a major advance in scholarship, and a good read. This is a wonderful tribute to all who contributed to British naval radar in the Second World War.

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DAVID SYRETT, *The Defeat of the U-Boats: The Battle of the Atlantic* (University of South Carolina Press, 1994), 334 pages, appendices, notes, bibliography, index. ISBN 0-87249-984-7.

So much has been written on the Battle of the Atlantic (1939–45) — what Syrett rightly calls the longest, largest, and most complex naval battle in history — that one is sometimes surprised there is anything more to say. This six-year struggle for mastery of the convoy routes between Europe and North America confronted all combatants with enormous challenges in strategy and tactics, technology and cryptanalysis, logistics and training. Meticulously examined over the years, the Battle of the Atlantic has provided attractive themes for a broad spectrum of writers, from novelist to scholar. The Battle still commands our attention.

In particular, the German Navy of the period continues to attract writers of books and articles on both sides of the Atlantic. Within the last five years alone, memoirs, scholarly studies, and popular histories have examined individual commands, surface ships, the submarine service, U-boat aces, technology, and the politics of the officer corps. Ironically, the German Navy's conduct of submarine warfare against shipping serves as a model even though it lost in two world wars. This is especially striking, for it was not German submarines in the Atlantic but American submarines in the Pacific that ultimately proved the efficacy of *guerre de course.* Numerous works have addressed the question as to why the Germans lost their great battle for maritime supremacy in World War II. Most recently, V. E. Tarrant (*The Last Year of the Kriegsmarine: May 1944 – May 1945*, London: Arms & Armour Press, 1994) sought answers by examining the battle's conclusion. His short, substantive volume highlighted the major issues involved in the critical period beginning just prior to the Normandy landings in June 1944 and ending with Germany's capitulation in May 1945. Seen in this light, defeat resulted from the cumulative effect of Allied superiority in a number of sectors, cryptanalysis salient among them.

David Syrett's study, by contrast, focusses on a period almost two years prior to capitulation, from April to December 1943, a period that Grand Admiral Dönitz himself had to recognize as "the turn" of battle against him. This marked the actual "defeat of the German U-Boats," of Syrett's title. Examining "the turn," as this phase is known, sheds light on emerging situations. It raises the question (which Syrett does not tackle) as to why the Germans continued for two years after 1943 when the battle was effectively lost.

Scholars, including Syrett, have long since identified the factors that defeated German submarines. In short, we see on the Allied side during "the turn" an overwhelming technological convergence with which the Germans simply could not compete with impunity. Key among these were: special intelligence, or cryptanalysis of German tactical signals; introduction of long-range, land-based aircraft to close over the Atlantic air gap or "black pit"; introduction of centimetric radar; advances in asdic/sonar; creation of Support Groups as "hunter killers"; perfection of "huff-duff," high frequency direction finding; the hedgehog ahead-throwing mortar; the creeping attack against deep submarines; and "swamp tactics" for overwhelming the enemy with superior forces.

"Because the narrative thrust of this study follows the sound of the guns" (page xii), Syrett intentionally omits background on such matters as development of technology, weapons systems, strategic planning, and resource allocation. That is quite proper. Only insofar as they affect moments of conflict, he forewarns, will he allude to them. Presumably, because he sees specialists as his target audience, he provides no explanations where the general reader might appreciate them. Such factors as dead reckoning, super-encipherment, whistle effect, *Zaunkönig*, mamba search, and hedgehog are introduced without comment.

Syrett's achievement lies in pulling all the elements of the technical convergence of 1943 together in a single volume and attempting to demonstrate their effect by describing typical convoy battles. Syrett's step-by-step account is clinical, correct — and colorless; it offers a mechanical display of one inanimate force against another. The following excerpts from the battle for convoy ONS 5 typify his approach and style: "Next the freighter *Harperly* was hit on the port side by two torpedoes fired by the *U-264*. One torpedo hit the ship in the engine room and the other near the foremast. Thirty-nine members of the crew took to the life boats. Twenty minutes later the *Harperly* sank" (page 78). Then, on to the next scenario: "The *Bristol City*, the lead ship in the port-most column of the convoy, was hit on the port side in the No. 4 hold by the first torpedo. A second torpedo hit the ship in the No. 1 hold. The crew of the *Bristol City* went over the side as the ship sank" (page 79). Here, as elsewhere, one misses insightful judgments. Pedestrian to a fault, he offers no insights into human beings, their decisions, or tragedies. Not even when the corvette HMS *Snowflake* leaves German survivors to drown is he moved to offer any meaningful comment. One mechanical event simply follow another: "The crew of the *U-125* was left to die in the water [and] at 0218 HMS *Snowflake* obtained a sonar contact which was lost three minutes later, and the corvette returned to its station in the screen" (page 90). Indeed, not a single character emerges from the sequence of tactics and losses. Nor does he offer a single description of the sea, an unforgiving and sometimes violent element which was arguably a major factor in the war — not only in maneuvers and target detection, but in human survival.

The Defeat of the German U-Boats is a technical book about devices, machines, and tactics which leaves us the concluding thought that the "U-boats lost...in 1943 because they were out-thought as well as out-fought by the Allies" (page 259). Written by a competent scholar who has examined original source material, it appeals to those already well-versed in the Battle of the Atlantic.

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Shorter Notices

FRED. G. H. BACHRACH, *Turner's Holland* (London: Tate Gallery, distributed by University of Washington Press, 1994), 72 pages, illustrations. Paper. ISBN 1-85437-140-1. $30.00.

This book was published in association with a Tate Gallery exhibition in 1994. It is neither very long nor very large (8" x 10½), it comes at a fairly substantial price, and its author is determined to find a political purpose behind nearly every picture. Nevertheless, it is a delight. Turner visited Holland several times from 1817 to 1842, and his love for that country, and particularly its seafaring heritage, is more than clear from lively sketches as well as the larger canvases, two dozen of which are illustrated here in color. Turner's relationship to the Dutch masters is discussed by the author; his steady evolution in the direction of impressionism is evident in his paintings. A few of his works are obviously Rembrandtesque biblical groupings, but overall, this is a catalog for a marvelous collection of maritime art — no substitute for the original exhibition, but still a valuable guide to Turner at sea.

KEN MACPHERSON AND JOHN BURGESS, *The Ships of Canada's Naval Forces, 1910–1933: A Complete Pictorial History of Canadian Warships* (St. Catharines, Ontario: Vanwell Publishing, 1994), 240 pages, illustrations, appendices, index. Paper. ISBN 0-920277-91-8. $35.00 (Canadian).

This massive (13½" x 10¼") reference work is exactly what the title claims: a Jane's-style alphabetical listing of all of Canada's warships to date. Each entry is provided with a black-and-white photograph and fairly detailed service record. Appendices include ship specifications, commanding officers, and a listing of ships by class. Although today's list of naval vessels in commission may be small, it should not be forgotten that the RCN included some 450 ships during World War II, and for that conflict, this book is an important reference source.

CAPT. FRED. G. GODFREY, *The Champlain Canal: Mules to Tugboats* (Monroe, NY: LRA, Dunderberg Road, RD 6, Box 41, Monroe, NY 10950-3703, 1994), xi + 123 pages, illustrations, glossary. ISBN 0-912526-66-1. $25.00.

This small book will delight anyone interested in American canals and canal life. Captain Godfrey represents the fourth generation of a canal family (at least six members were tugboat captains), and his knowledge and experience are unrivaled. The Champlain Canal ran from Lake Champlain to the Hudson River from its formal opening in 1823 until it was superseded by the Champlain Barge Canal in 1915. In this work, Godfrey discusses the canal almost mile by mile, carefully outlining the development of transport along its route and the life of the people who lived upon it. Much of the canal is gone today, as is at least some of the cargo which moved along it — only the history minded, for example, will know that ice cut from the rivers and stored for a predictable summer urban market was a major commodity. Some 115 historic photographs are an invaluable addition to the work; it would be improved, however, by a good map.

BERND LANGENSIEPEN AND AHMET GULERYUZ, *The Ottoman Steam Navy, 1828–1923.* Edited and translated by James Cooper. (Annapolis: Naval Institute Press, 1995), 201 pages, illustrations, index. ISBN 1-55750-659-0. $49.95.

This is a fascinating large-size reference history of a little known but not unimportant fleet from its origins until the foundation of the Turkish Republic after World War I. The basic source material used is the largely untapped Turkish naval archives, which the authors have mined to very good effect. The many photographs not only illustrate the history of the fleet, but since they were often taken in port with crewmen and local activities much in view, they can also be used as a gloss on social history. Particular attention, not surprisingly, is given to the operations of World War I, not omitting those of the *Yavuz Sultan Selim* and the *Midilli*, better known in Europe as the *Goeben* and the *Breslau*, whose "escape" ruffled so many feathers in 1914. This book should interest anyone concerned with Mediterranean sea power in the century which it covers, as well as those who study the evolution of smaller fleets in an era of massive technological change.

ALAN J. SCARTH, *The Ship Models Collection of Merseyside Maritime Museum: A Concise Catalogue.* (Liverpool: National Museums & Galleries on Merseyside, 1995), 104 pages, illustrations, index. Paper. £8.50.

The Merseyside Maritime Museum holds nearly 800 ship models from all eras and sources; not surprisingly, it is particularly strong in nineteenth and twentieth century Liverpool merchantmen. The catalog is arranged chronologically by ship type, with basic information provided on tonnage, builder, and so on. Only a dozen or so are illustrated (a few in color); basically, this is a reference for students of the collection or those in search of a particular vessel. It is available direct from the publisher, 127 Dale Street, Liverpool, L69 3LA, UK. Add £3.00 for postage and handling.

AIDAN MCIVOR, *A History of the Irish Naval Service.* (Dublin: Irish Academic Press, 1994), 256 pages, index, bibliography, illustrations. ISBN 0-7165-2523-2. £19.95.

For a sea-girt nation, Ireland has paid astonishingly little attention to its maritime environment from a naval standpoint. The Irish Civil War of the '20's and World War II were the exceptions that proved the rule — until the EEC in 1976 established 100-mile economic zones and the Marine Service, which seldom had amounted to more than three old corvettes, suddenly began to acquire modern patrol vessels with some help from Brussels. Aidan McIvor provides an interesting and detailed history of this small force, bringing the story up to a present which involves drug and gun runners as much as fishery protection. The chapter on World War II should interest many who know that Norway was nervous about both Britain and Germany, but may not realize that Eire had much the same dilemma. The text is supplemented by some thirty-three photos and several useful maps. Though the first edition is nearly sold out, a second printing is planned: contact International Specialized Book Services, 3804 NE Hassalo Street, Portland, OR 97213.

SHELLY WACHSMANN, *The Sea of Galilee Boat: An Extraordinary 2000 Year Old Discovery.* (New York and London: Plenum Press, 1995), xviii + 420 pages, illustrations, bibliography, index. ISBN 0-306-44950-1. $24.95.

Shelly Wachsmann, former Israeli inspector of underwater antiquities and now with the Texas A&M Nautical Archaeology Program, spent a frantic two weeks in 1986 uncovering a small sailing vessel (some 26.5' in length) from the shoreline mud of the Sea of Galilee. Fierce drought had uncovered the boat, but the water was returning — hence the haste. No such boat had previously been found, and, given its carbon-14 dating of between 10 B.C. and 67 B.C., it has many interesting ramifications for the field of Biblical archaeology. Professor Wachsmann tells the story with verve, drama, and, not least, considerable humor; his personal participation adds not a little to an interesting tale which, for all its light-hearted style is supported by sound, scientific scholarship. Altogether a readable, well-illustrated, reasonably priced, and significant book.

JOHN B. HATTENDORF, ED., *Doing Naval History: Essays Toward Improvement.* (Newport, RI: Naval War College Press, Historical Monograph Series, 13, 1995), xi + 160 pages. ISBN 1-884733-06-9. Paper. $8.00.

John Hattendorf's 1994 collection, *Ubi Sumus? The State of Naval and Maritime History*, resulted from the first Yale–Naval War College conference (1993) on the current state of naval and maritime history of concern: bureaucracy and technology (James Goldrick, John Tetsuro Sumida, David Alan Rosenberg, and Robert Jervis), domestic politics (Volker Verghahn and Robert S. Wood), comparative history (Paul G. Halpern and William R. Thompson), general naval history (N. A. M. Rodger and Dennis E. Showalter), and finally, "general reflections" from Paul M. Kennedy and Mark R. Shulman. The papers are short and through necessity fairly general in content, but Professors Hattendorf and Kennedy, the conference organizers, have assembled an extraordinary crew of experts. It is a collection which every student of naval history should work through. Available from the Naval War College Museum Store, 686 Cushing Road, Newport, RI 02841-1207. Add $2.00 for postage.

LARRY S. CHOWNING, *Chesapeake Legacy: Tools and Traditions.* (Centreville, MD: Tidewater Publishers, 1995), xii + 307 pages, illustrations, index. ISBN 0-87033-468-9. Paper. $29.95.

Larry Chowning, long-time field editor for *National Fisherman* and author of several books on the Chesapeake, including *Harvesting the Chesapeake: Tools and Traditions*, here collects some thirty chapters — some of which have appeared in various periodicals — on a wide variety of Bay subjects. Most have to do with specialty fishing industries, such as the hoop net fishery for catfish on the Sassafras River or midnight dragging for conch. Others, as the title indicates, treat tools — "how to make shaft tongs," for example — or vessels, such as the fishing bateaux, or "Yankee skiffs." Yet a third category combines local custom with social history; from this book, for example, you may learn how Maxwell Chandler, 87 years old, cooks up a tasty dish of muskrat. Though a bit of a hodge-podge, this is a delightful book, mainly because it focuses throughout on the watermen. Chowning has immense rapport with his informants, and his easy style combined with the numerous delightful photographs make this book a must not only for anyone interested in the Chesapeake, but also for those concerned with the larger world of American maritime traditions.

RHYS RICHARDS, *The Foveaux Whaling Yarns of Yankee Jack.* (Dunedin North, New Zealand: Otago Heritage Books, 1995), 152 pages, index, illustrations, maps. ISBN 0-908774-12-5. Paper. $29.95 (NZ).

RHYS RICHARDS, *"Murihiku" Re-Viewed: A Revised History of Southern New Zealand from 1804 to 1844.* (Wellington, New Zealand: Lithographic Services, 1995), 152 pages, index, illustrations, maps. ISBN 0-473-02837-9. Paper. $29.95 (NZ).

Readers of *The American Neptune* may best know New Zealand historian Rhys Richards as author of the Special Supplement to Volume 54, *United States Trade with China, 1784–1814*. In these two new studies, however, he focuses on the maritime history of his home territory.

The Foveaux Whaling Yarns is in fact a thoroughly annotated edition of a major portion of a scarce volume of memoirs by American Captain Burr Osborn, *Reminiscences of a Voyage Abroad: The World in the Forties*, published in 1892. Osborn spent some time whaling in the Foveaux Strait in 1845, and his lively memoir is a valuable addition to the literature on early settlement activities there. Richards has done his usual thorough job in supplying details from Osborn's family and other research, together with maps and photographs. Short of purchasing this volume, the only other way to read Osborn is to consult what appears to be the only remaining copy of the original edition, now in the library of the New Bedford Whaling Museum.

"Murihiku" Re-Viewed is dedicated to Robert McNab, a pioneering New Zealand historian who brought together many important primary sources in several books written nearly a century ago. One of these was *Murihiku: A History of the South Island of New Zealand and the Islands Adjacent*, published in several editions (with minor title changes) between 1904 and 1909. In this second volume under review, Richards offers a short summary of settlement in the south, concentrating particularly on the sealing and whaling activities which he knows well, and supplying where possible data and references which were not available to McNab. Indeed, roughly half the volume is composed of appendices, mainly accounts published in the nineteenth century in local newspapers — much in the style of McNab's own works. It is thus a useful supplement to the fairly limited literature on New Zealand bay and shore whaling.

Both books are the same price and length, though the format of *"Murihiku" Re-Viewed* is the larger of the two (10½" x 7¾"), and both may be obtained from Lithographic Services, Ltd., PO Box 38-138, Wellington, New Zealand, VISA is accepted.

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